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(54) **COMPRESSIBLE BARBELL ADAPTER**

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A63B 21/008	(2006.01)
A63B 21/00	(2006.01)
A63B 71/00	(2006.01)

(52) **U.S. Cl.**

CPC ***A63B 21/0724*** (2013.01); ***A63B 21/00069*** (2013.01); ***A63B 21/0081*** (2013.01); ***A63B 21/1484*** (2013.01); ***A63B 21/1488*** (2013.01); *A63B 2071/0063* (2013.01); *A63B 2225/09* (2013.01)

(58) **Field of Classification Search**

CPC .. A63B 21/06; A63B 21/062; A63B 21/0623; A63B 21/0626; A63B 21/072; A63B 21/0722; A63B 21/0724; A63B 21/0726; A63B 21/075; A63B 21/078; A63B 21/00069; A63B 2071/0063; A63B 2225/09

USPC 482/92–95, 104, 106–113, 128, 139, 482/148

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,502,326	A *	3/1970	Schaeffer	482/40
3,545,121	A *	12/1970	Misko	446/486
3,726,522	A *	4/1973	Silberman	482/107
3,938,803	A *	2/1976	Wilmoth et al.	482/132
4,618,142	A *	10/1986	Joseph, Jr.	482/82
4,775,149	A *	10/1988	Wilson	482/126
4,822,035	A *	4/1989	Jennings et al.	482/106
4,838,542	A *	6/1989	Wilkinson	482/45
4,913,417	A *	4/1990	Francu	482/45
4,978,122	A *	12/1990	Dibowski	482/106
5,152,731	A *	10/1992	Troutman	482/106
5,628,713	A *	5/1997	Wilkinson	482/74

(Continued)

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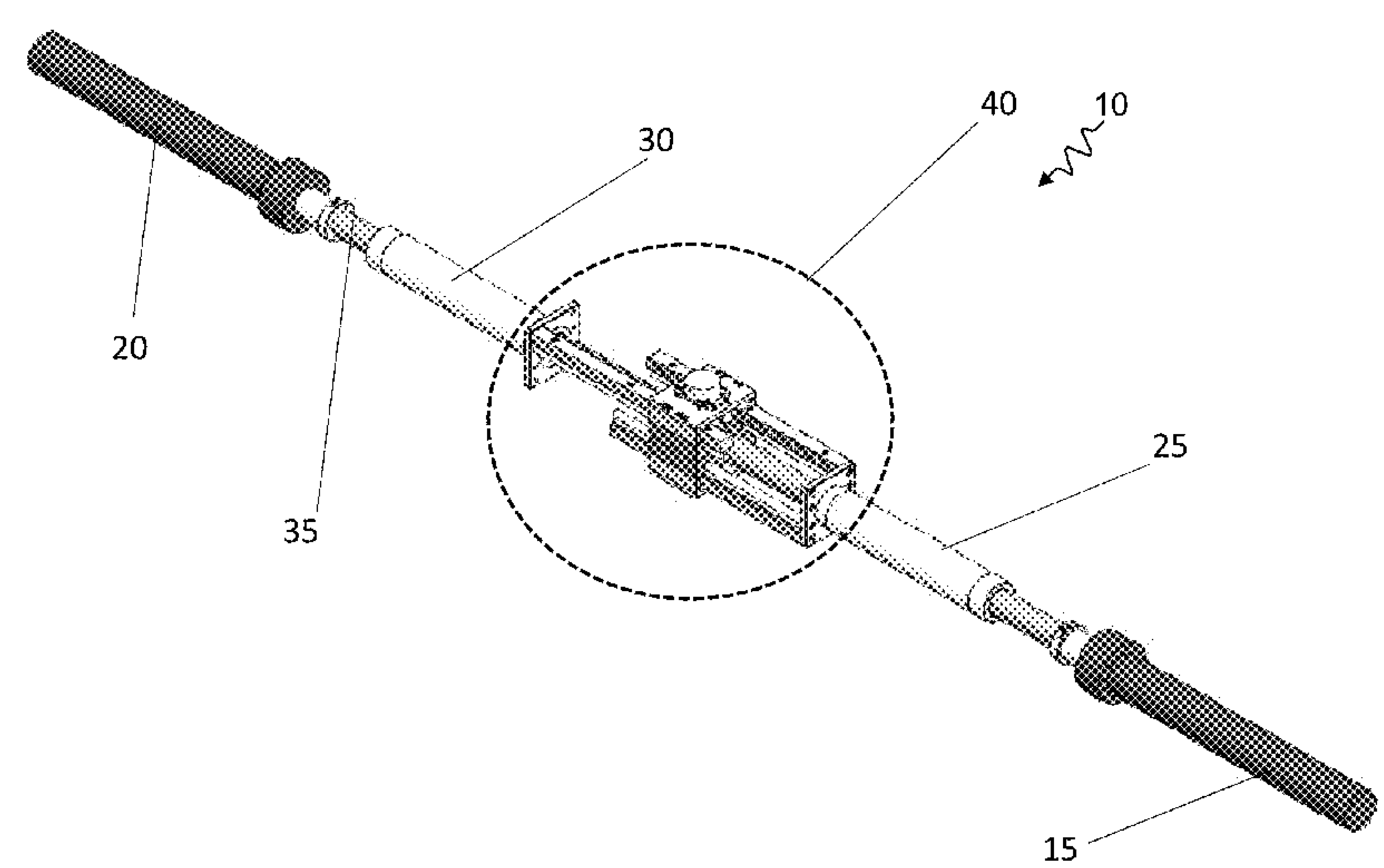
(57) **ABSTRACT**

A compressible barbell adapter is disclosed, which consists of a compression-retraction member fastened to a hollow shaft for use on a bar. The compression and retraction movement of the compression-retraction member is generally achieved by means of a pinion and a rack system, and can be utilized in conjunction with dampening means. Slidable handles are also connected to the compression-retraction member, and serve to slide along the axis of the hollow shaft, and thus along the bar. The compressible barbell adapter is meant to be fastened onto existing bars or barbells such that additional exertion is focused on the pectoral, deltoid and back muscles during various exercises.

9 Claims, 20 Drawing Sheets



(56) **References Cited**

U.S. PATENT DOCUMENTS

6,022,300	A	2/2000	Hightower	
6,672,573	B2 *	1/2004	Berton	267/136
7,086,999	B2	8/2006	Jeneve et al.	
7,108,636	B1 *	9/2006	Garcia	482/40
7,862,486	B1	1/2011	Watson	
7,892,158	B2	2/2011	Varga	
8,506,460	B2 *	8/2013	Seitzer	482/106
8,672,815	B1 *	3/2014	Springer	482/106
2002/0128127	A1 *	9/2002	Chen	482/106
2007/0203002	A1 *	8/2007	Webber	482/104
2008/0045389	A1 *	2/2008	Bruce	482/112
2008/0076636	A1 *	3/2008	Smith	482/1
2009/0197745	A1 *	8/2009	Olson	482/107
2010/0190618	A1 *	7/2010	Chen	482/108
2012/0094812	A1 *	4/2012	Smiley	482/128
2012/0165165	A1 *	6/2012	Iankov	482/106
2013/0035218	A1 *	2/2013	Wierszewski	482/106
2013/0059696	A1 *	3/2013	Hijmans et al.	482/8
2013/0184129	A1 *	7/2013	Lovegrove et al.	482/107
2013/0196830	A1 *	8/2013	Pfitzer	482/110
2013/0296145	A1 *	11/2013	Tomaszewski	482/106
2014/0274596	A1 *	9/2014	Krull	482/107

* cited by examiner

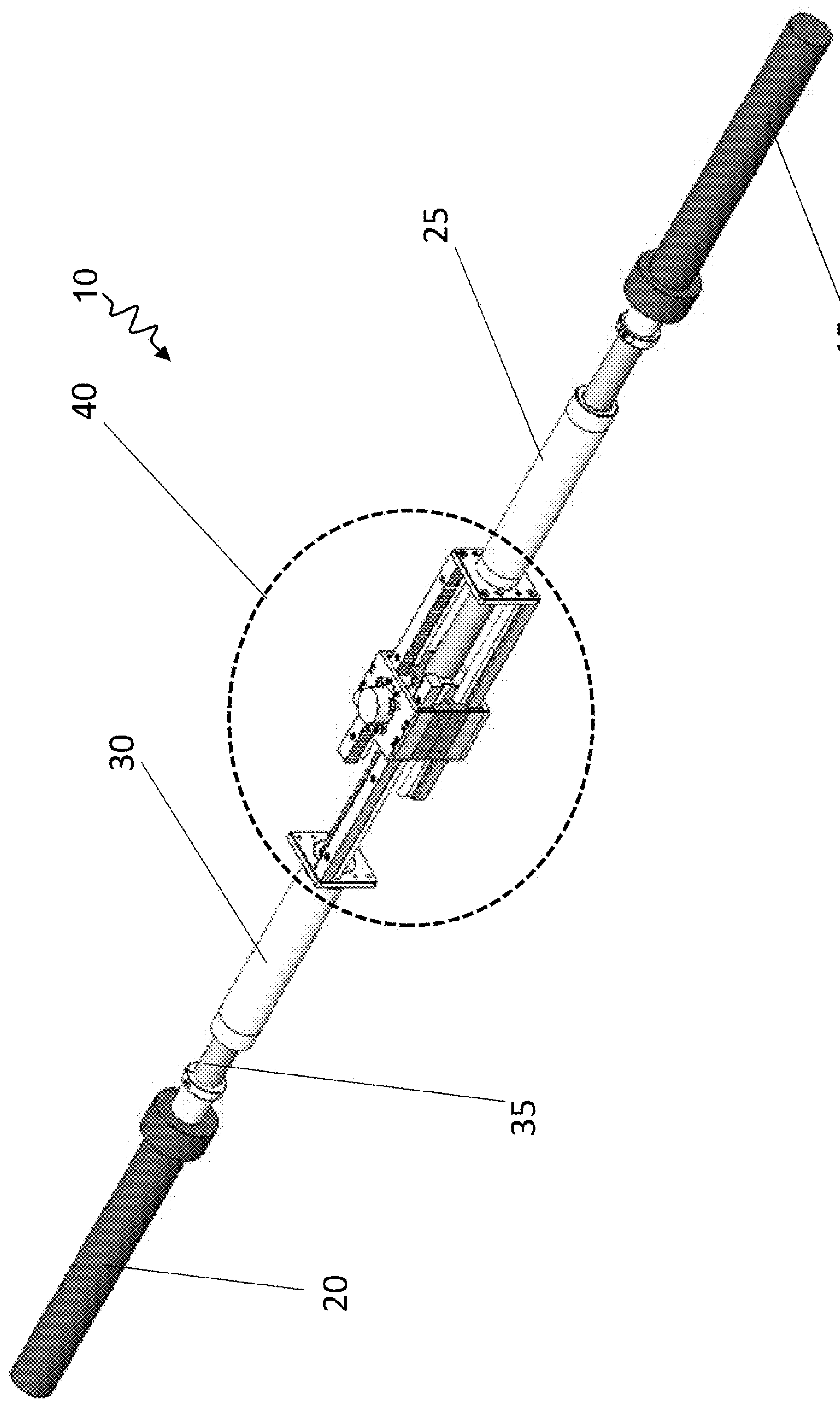


FIG. 1

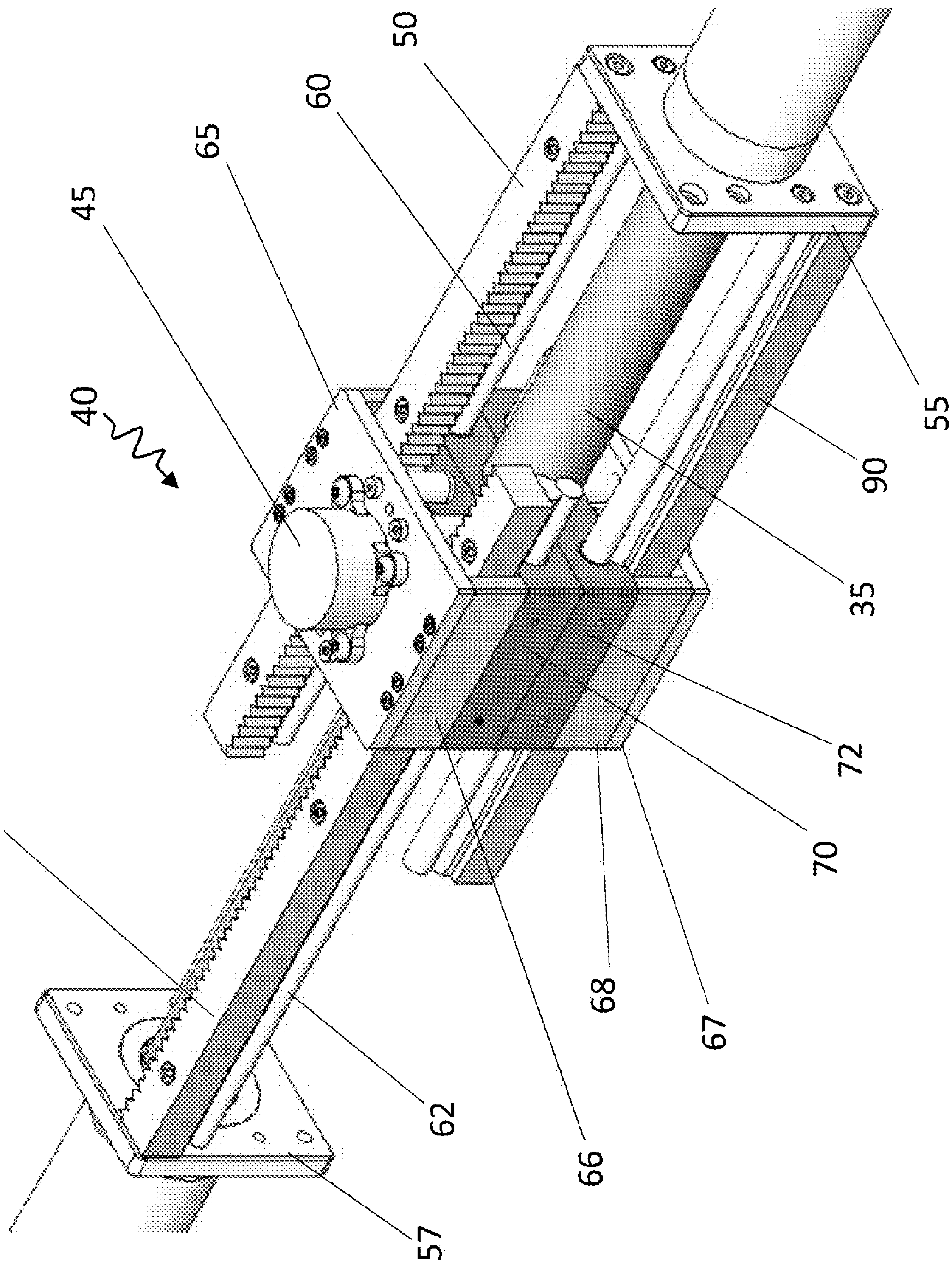


FIG. 2

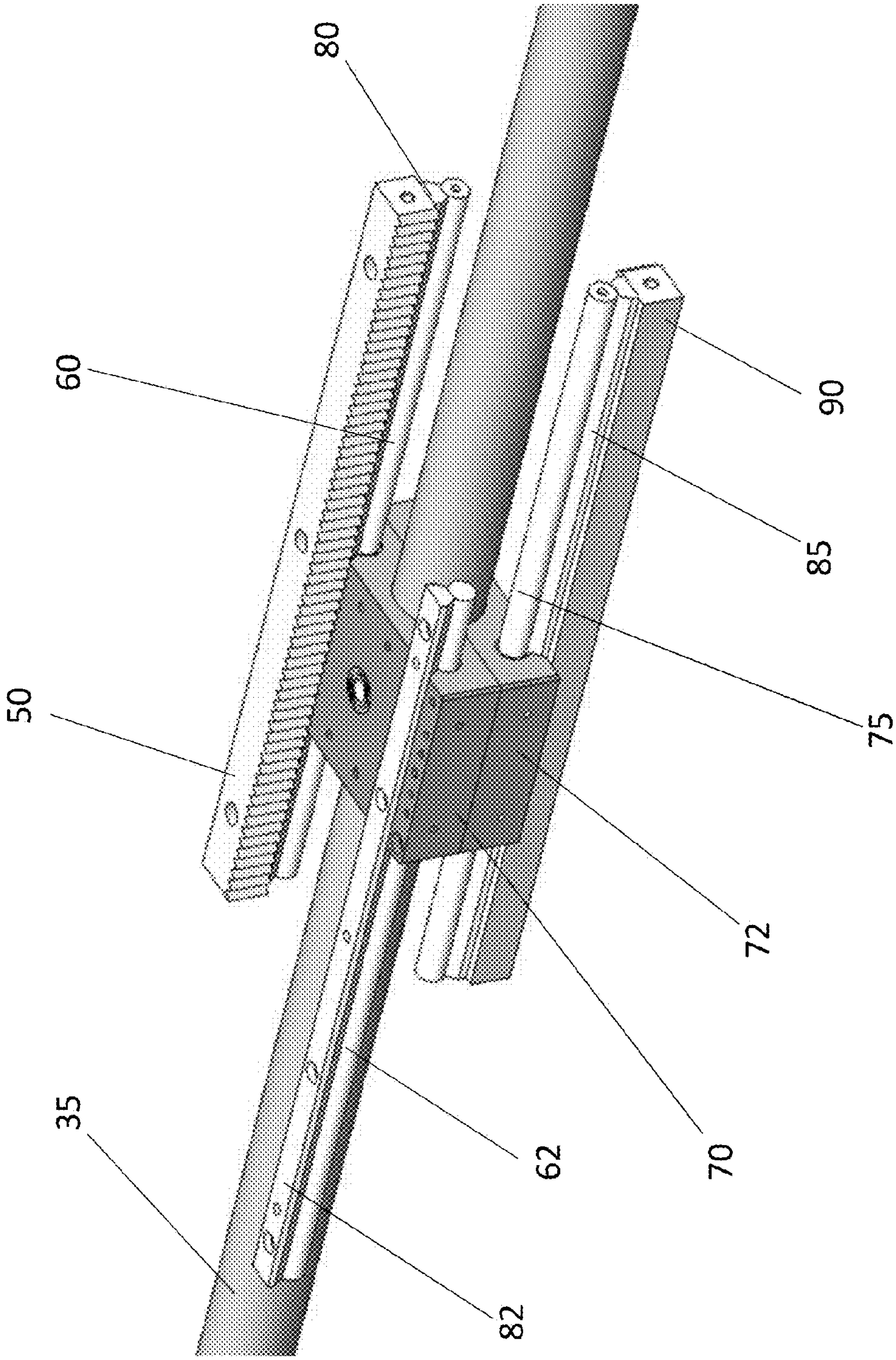


FIG. 3

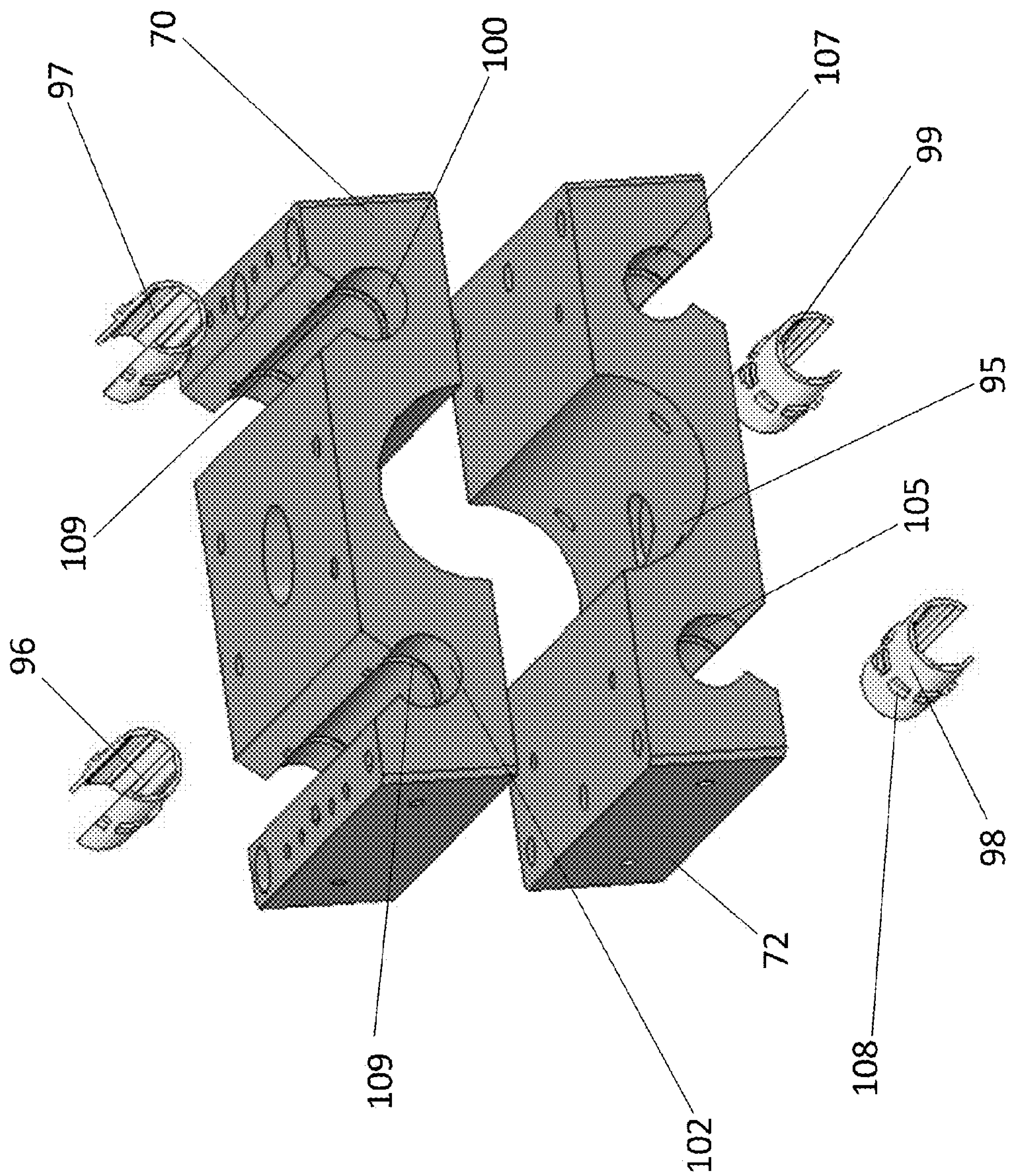


FIG. 4

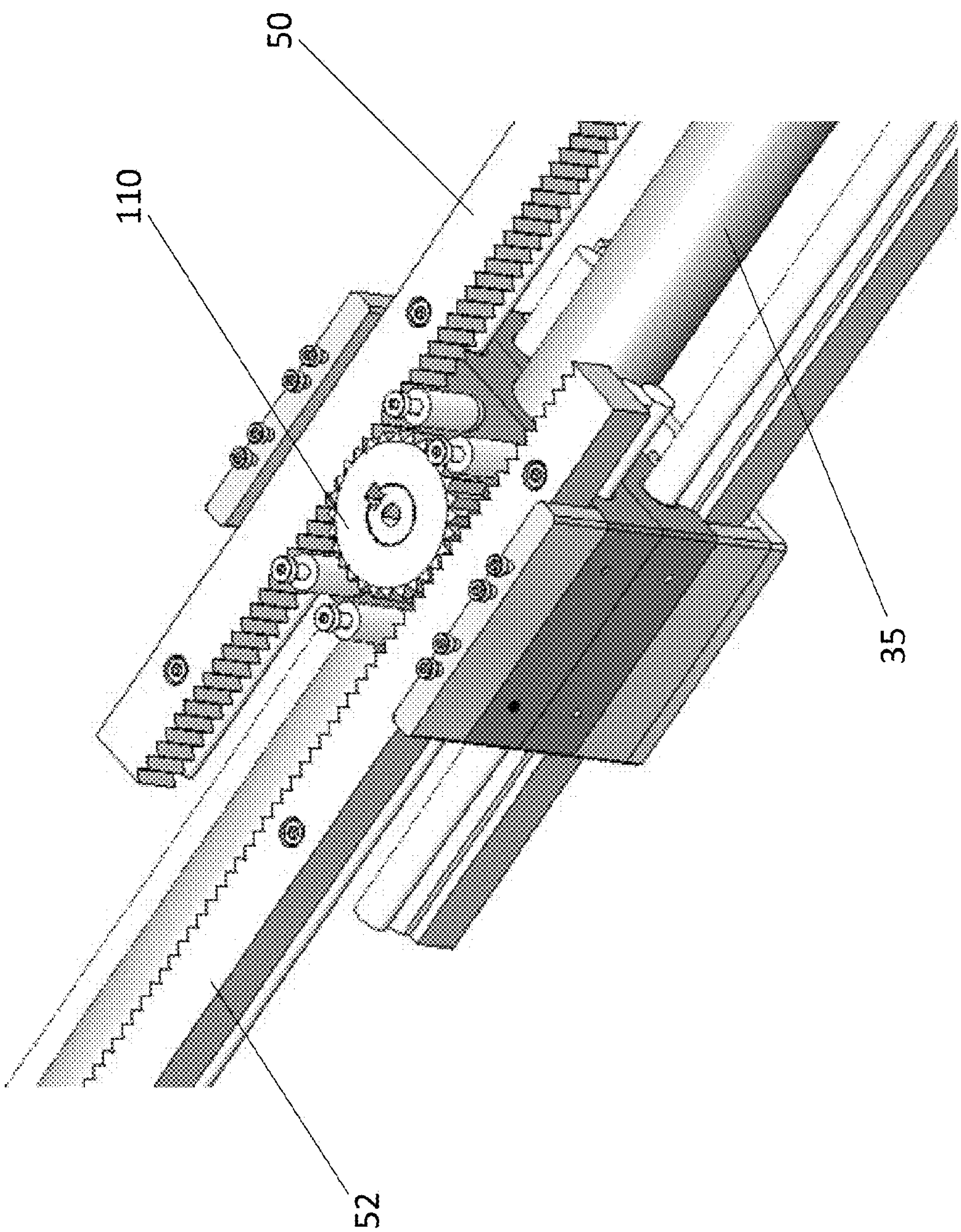


FIG. 5

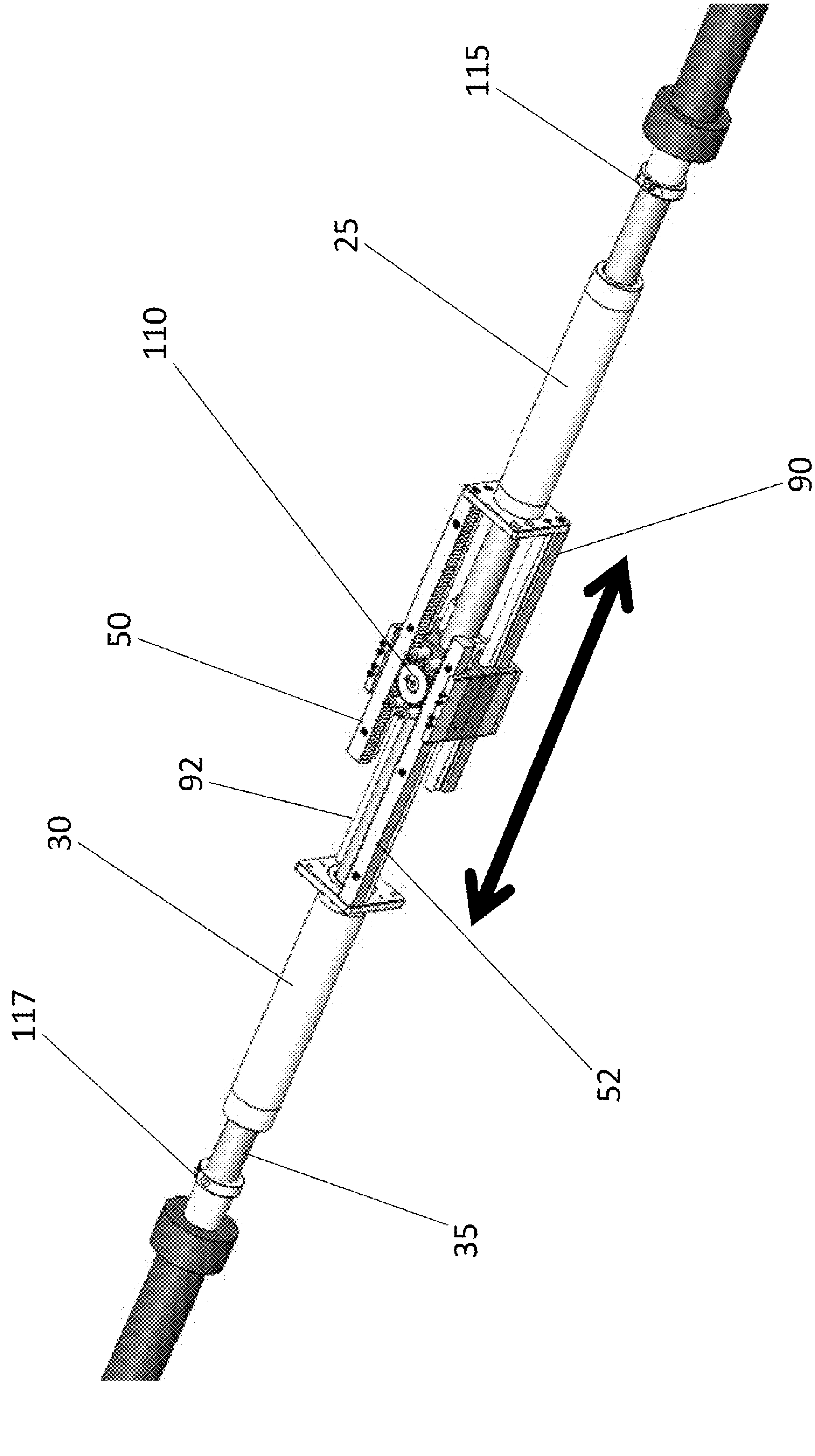


FIG. 6

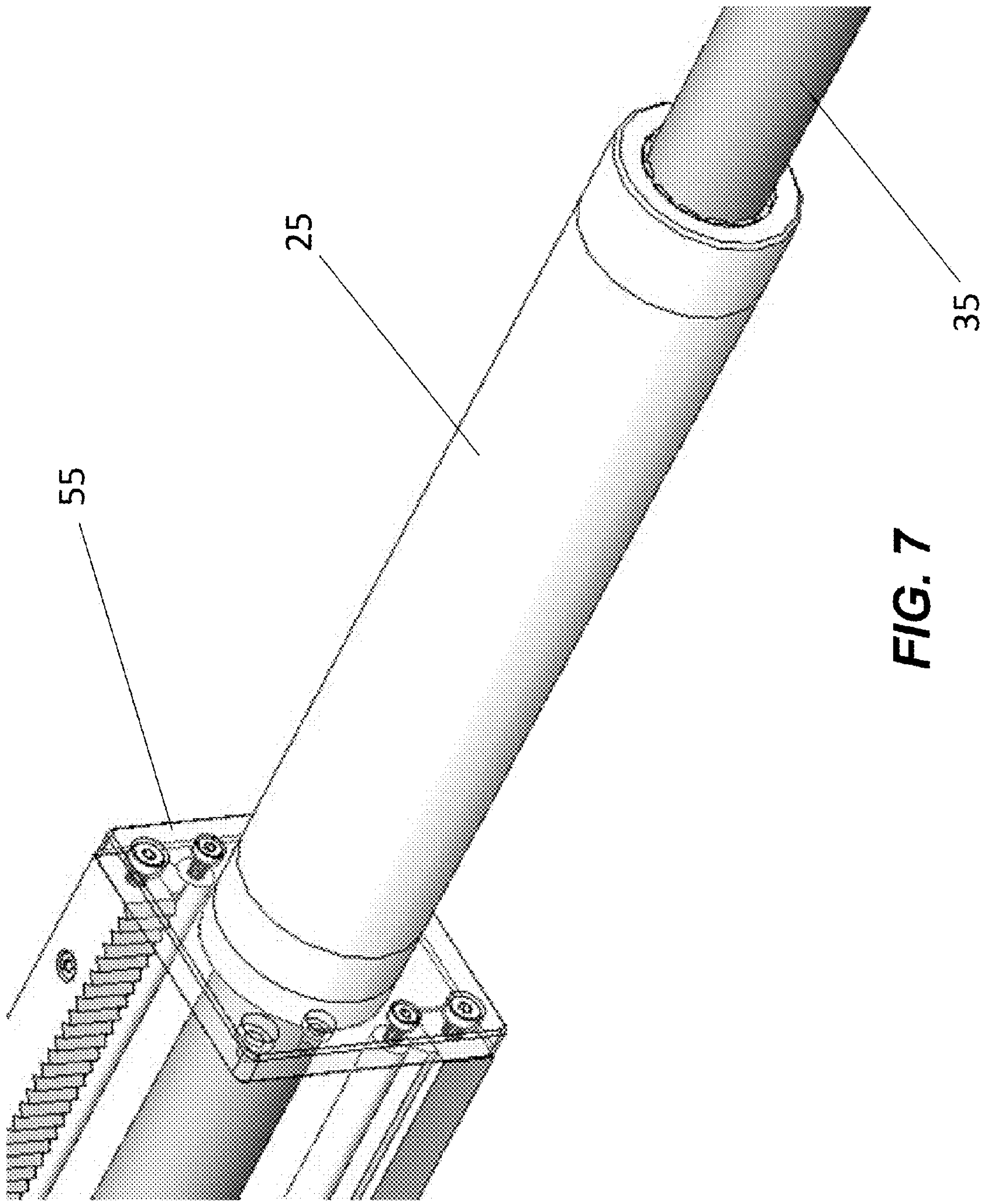


FIG. 7

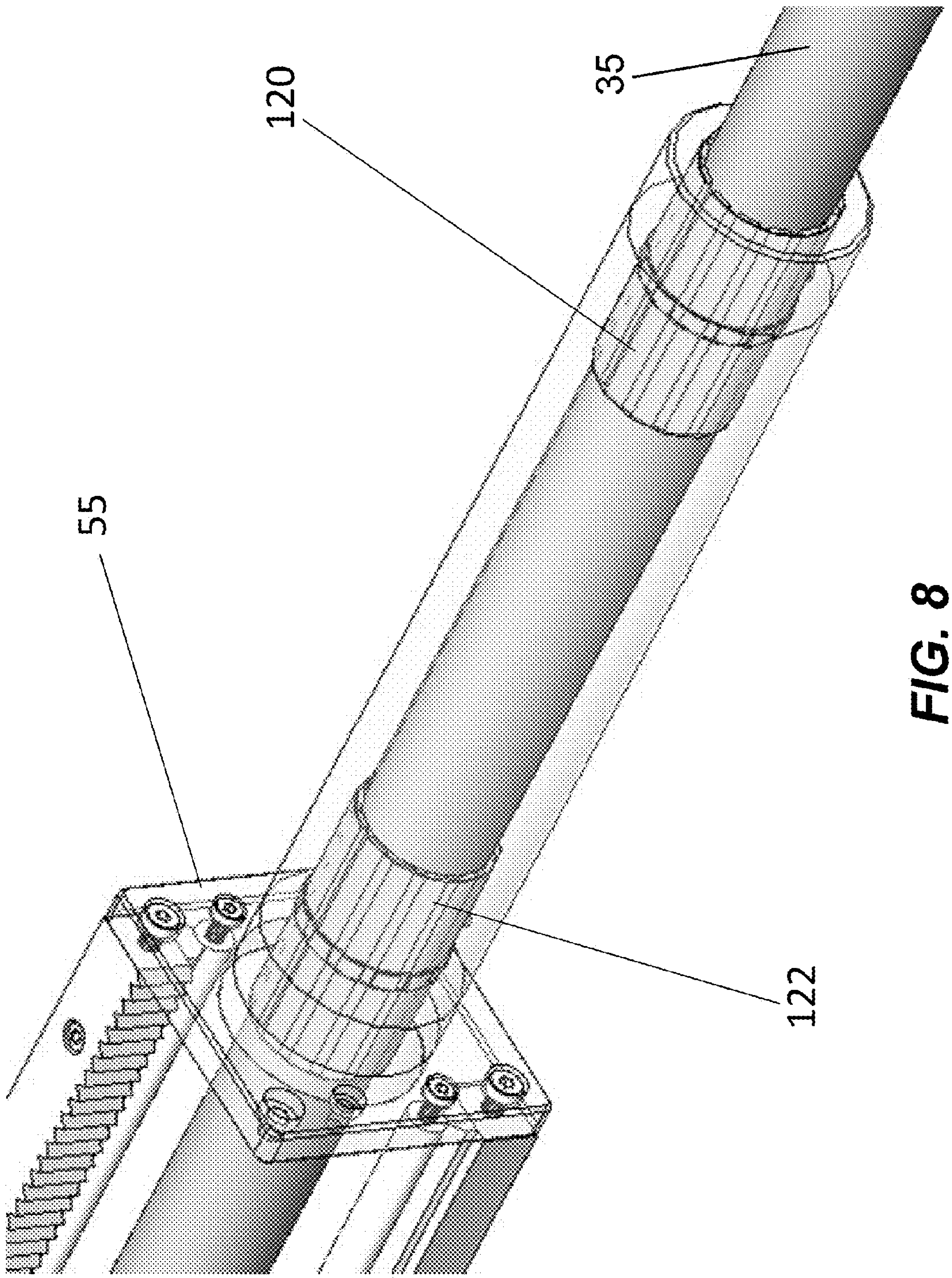


FIG. 8

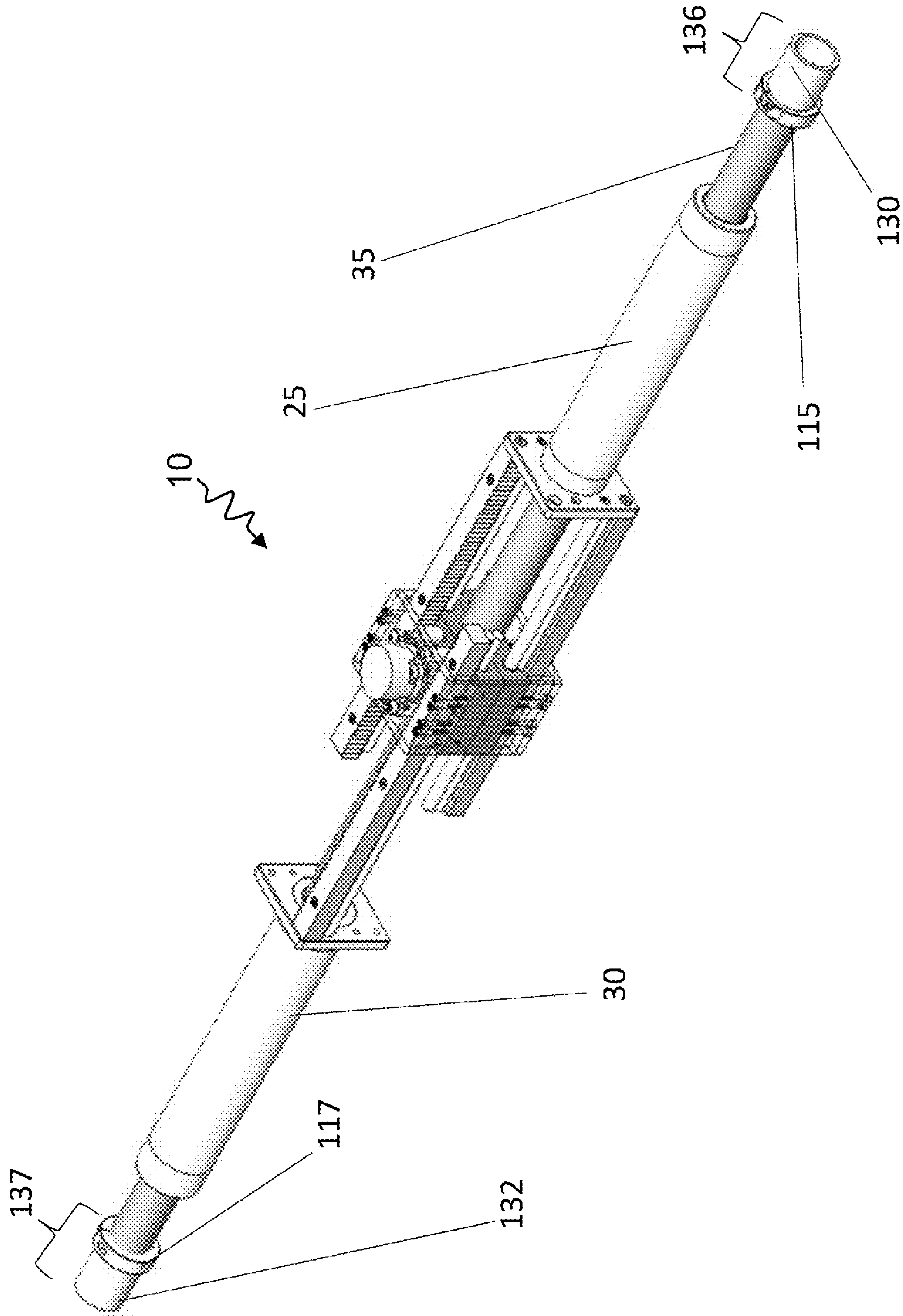


FIG. 9

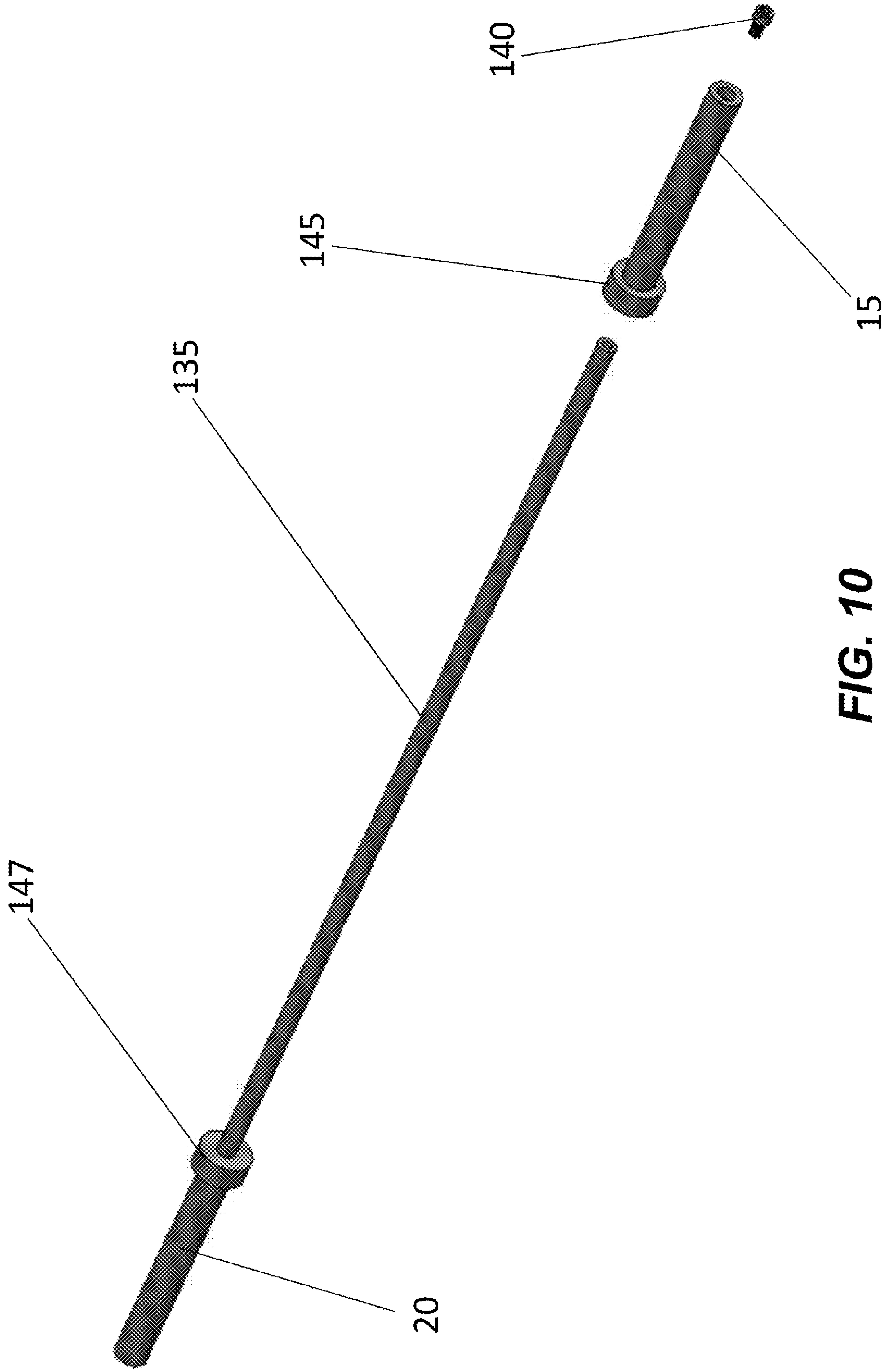


FIG. 10

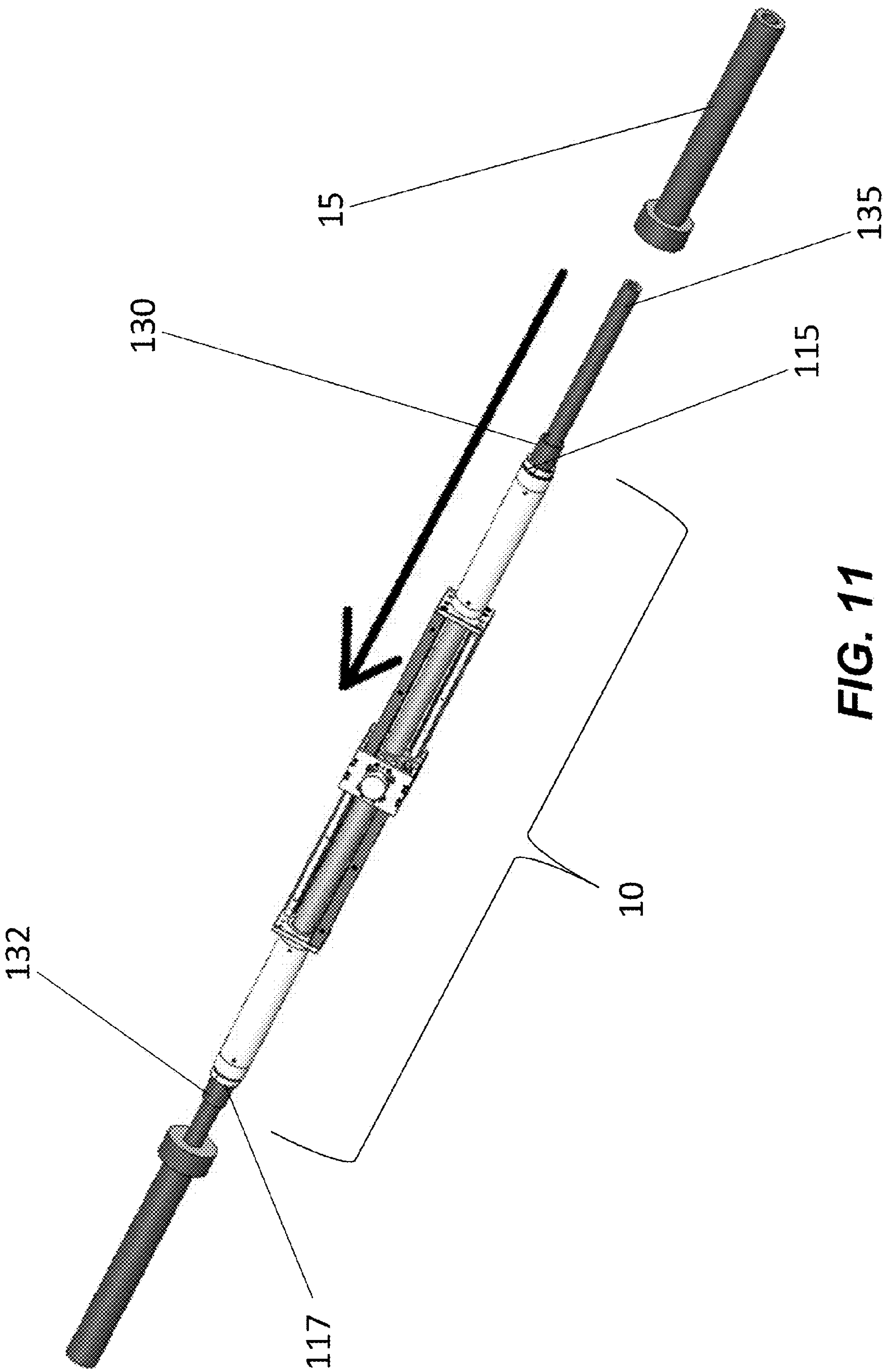


FIG. 11

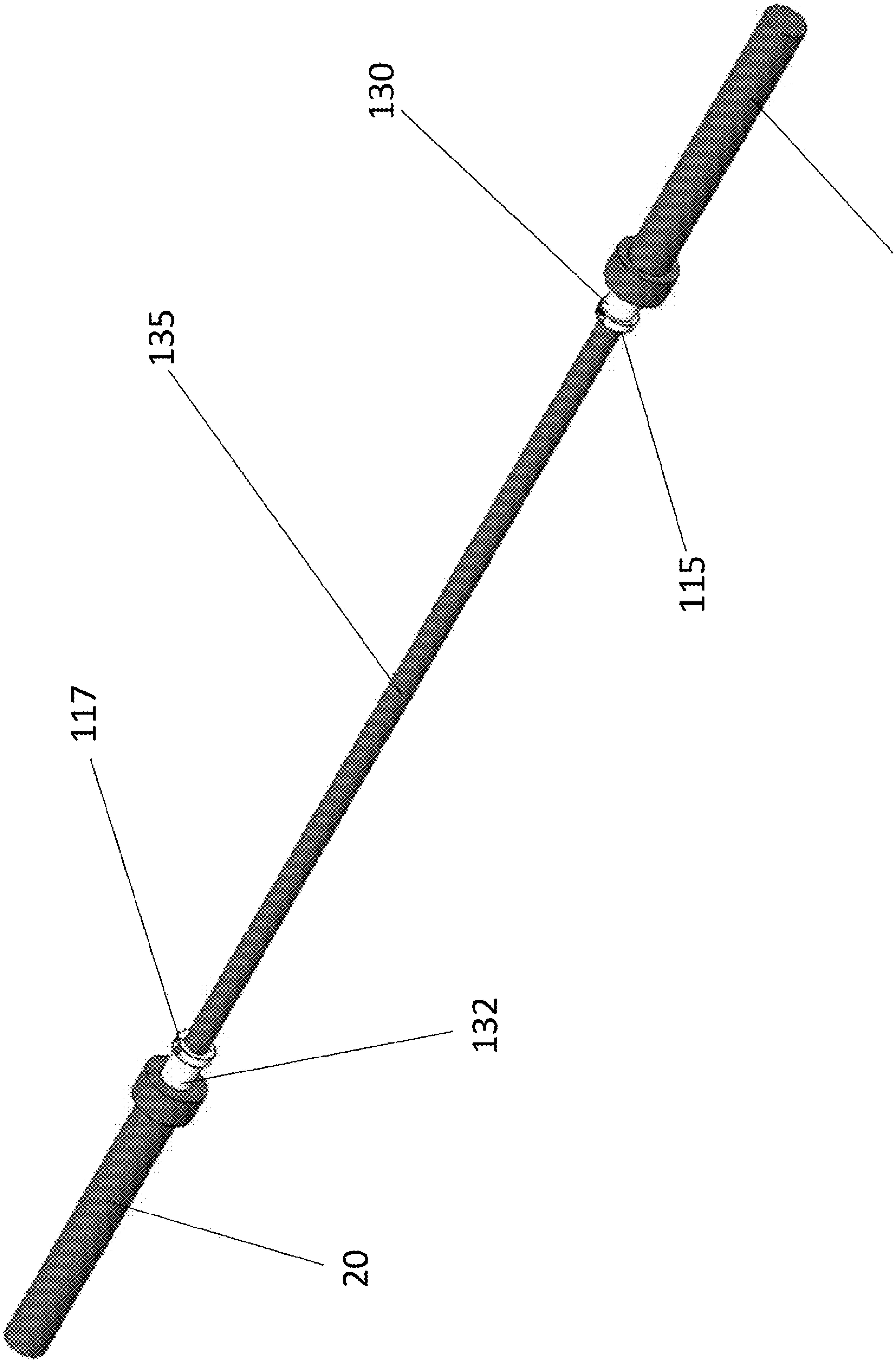


FIG. 12

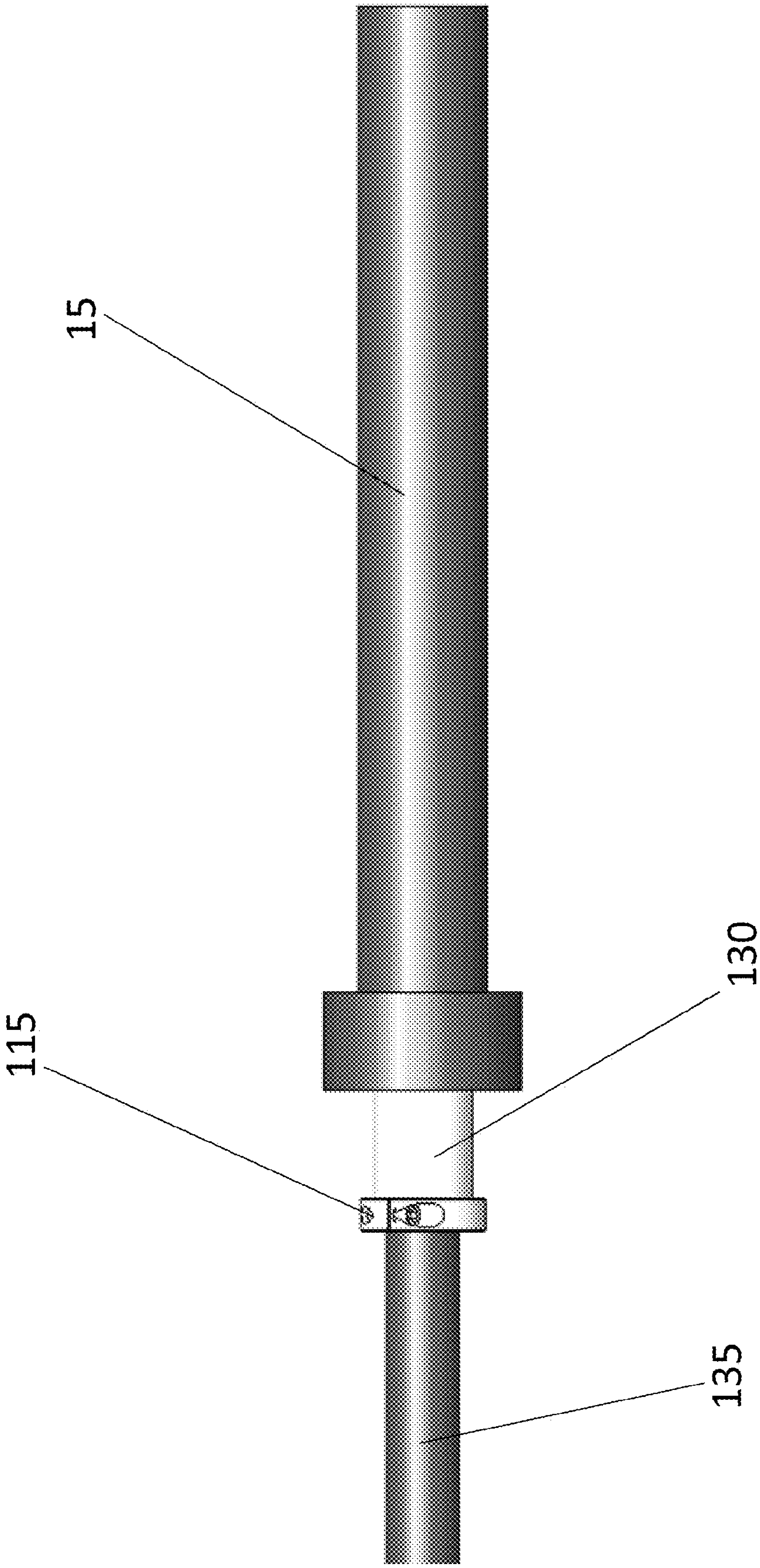


FIG. 13

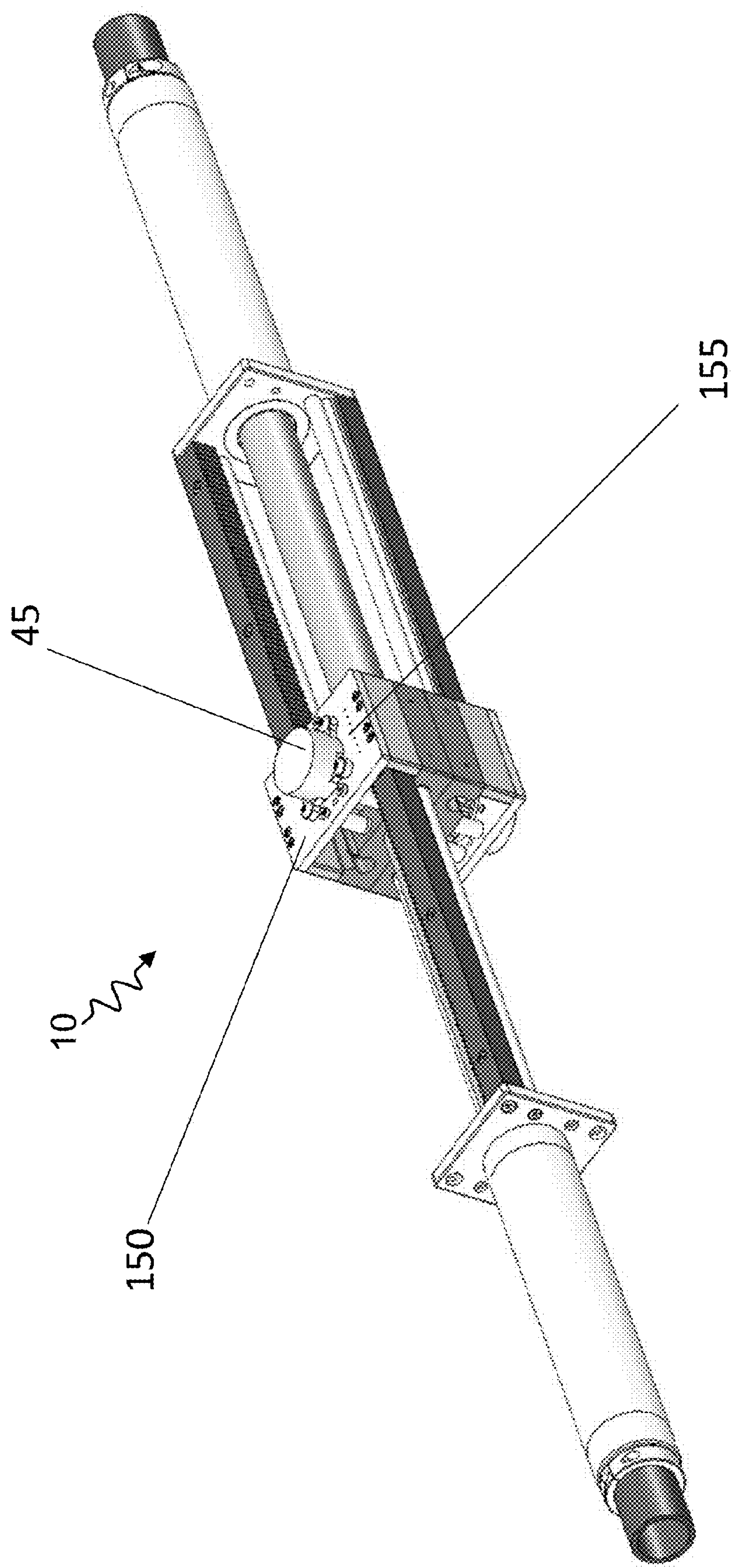


FIG. 14

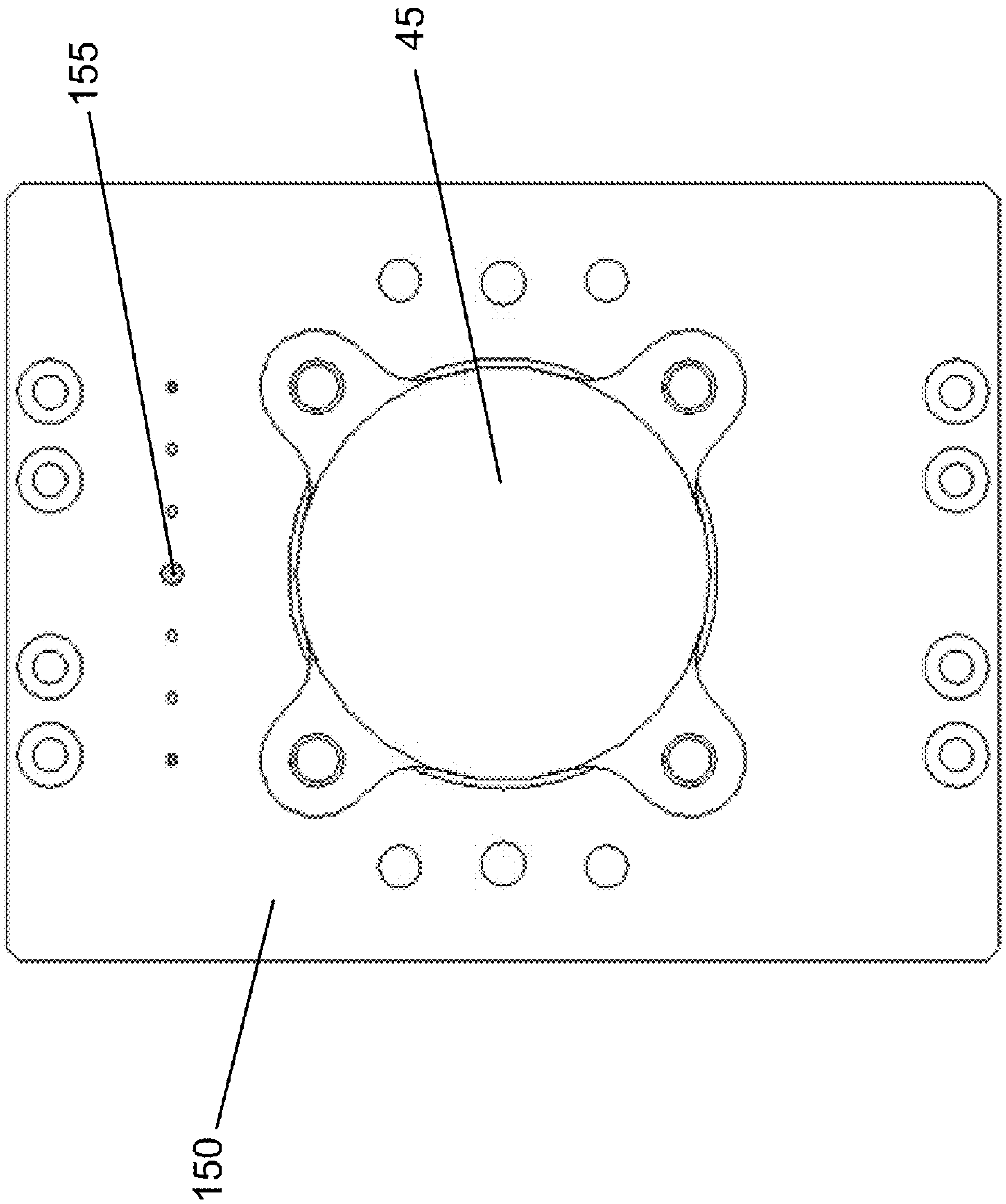


FIG. 15

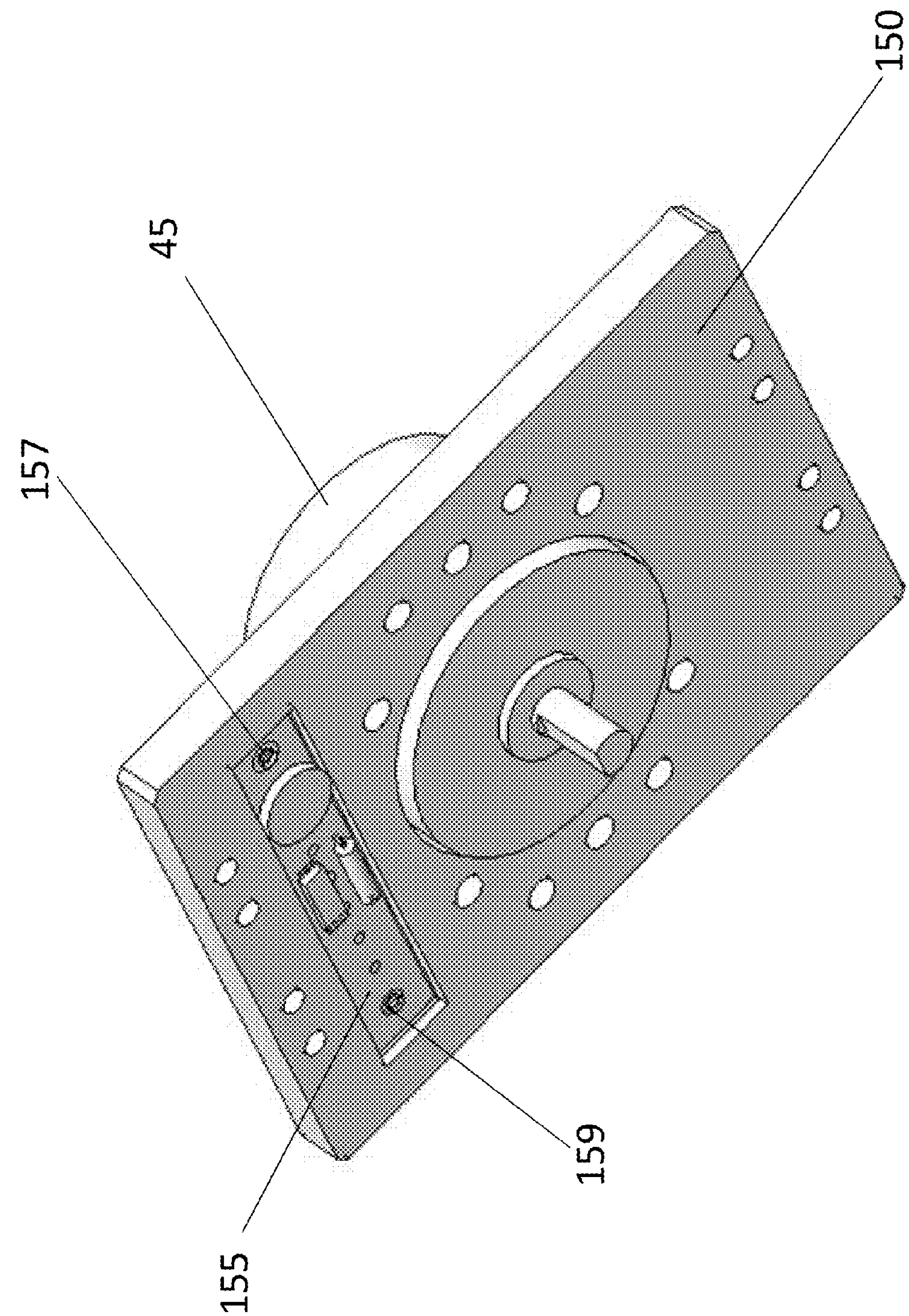


FIG. 16

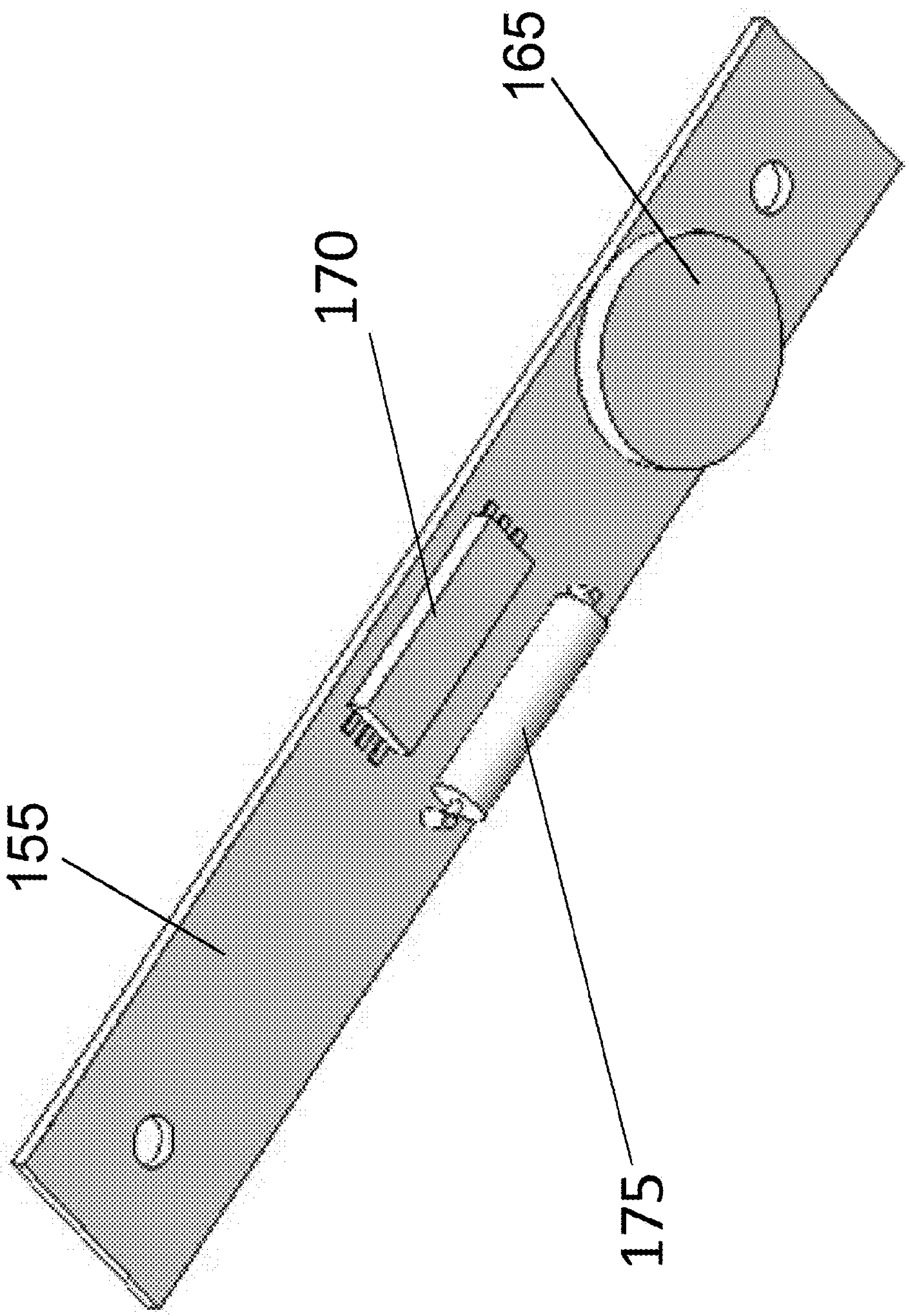


FIG. 17A

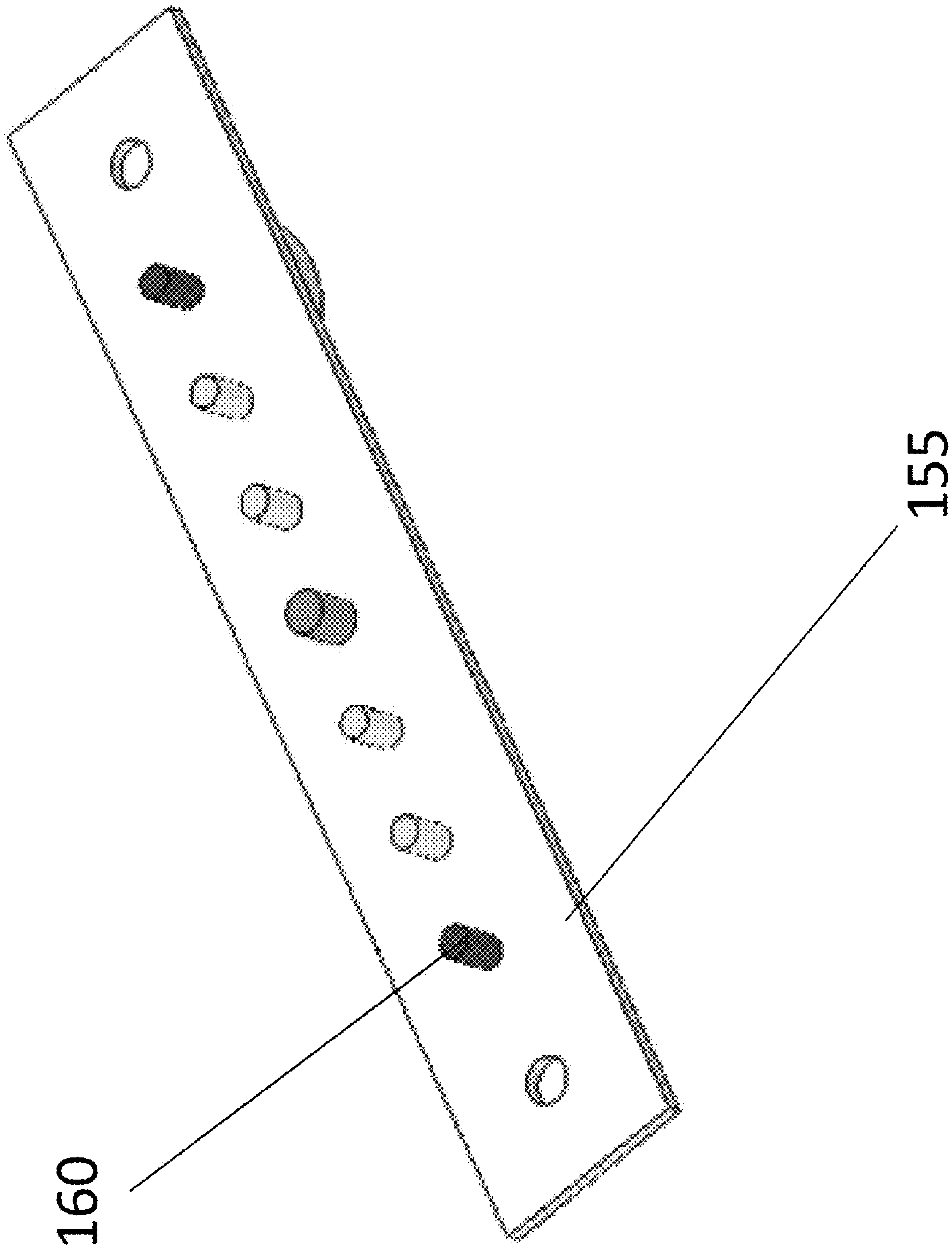


FIG. 17B

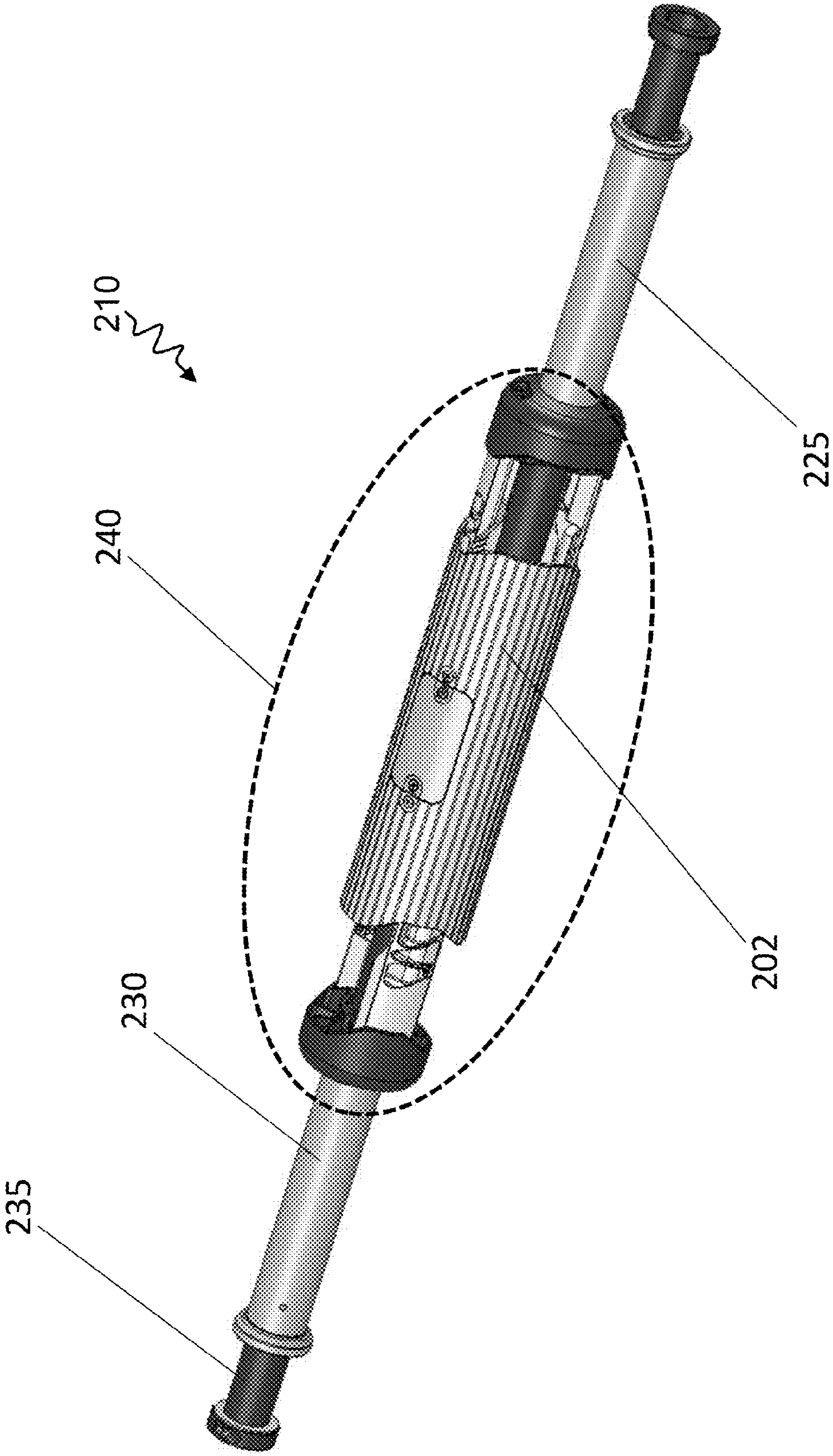


FIG. 18

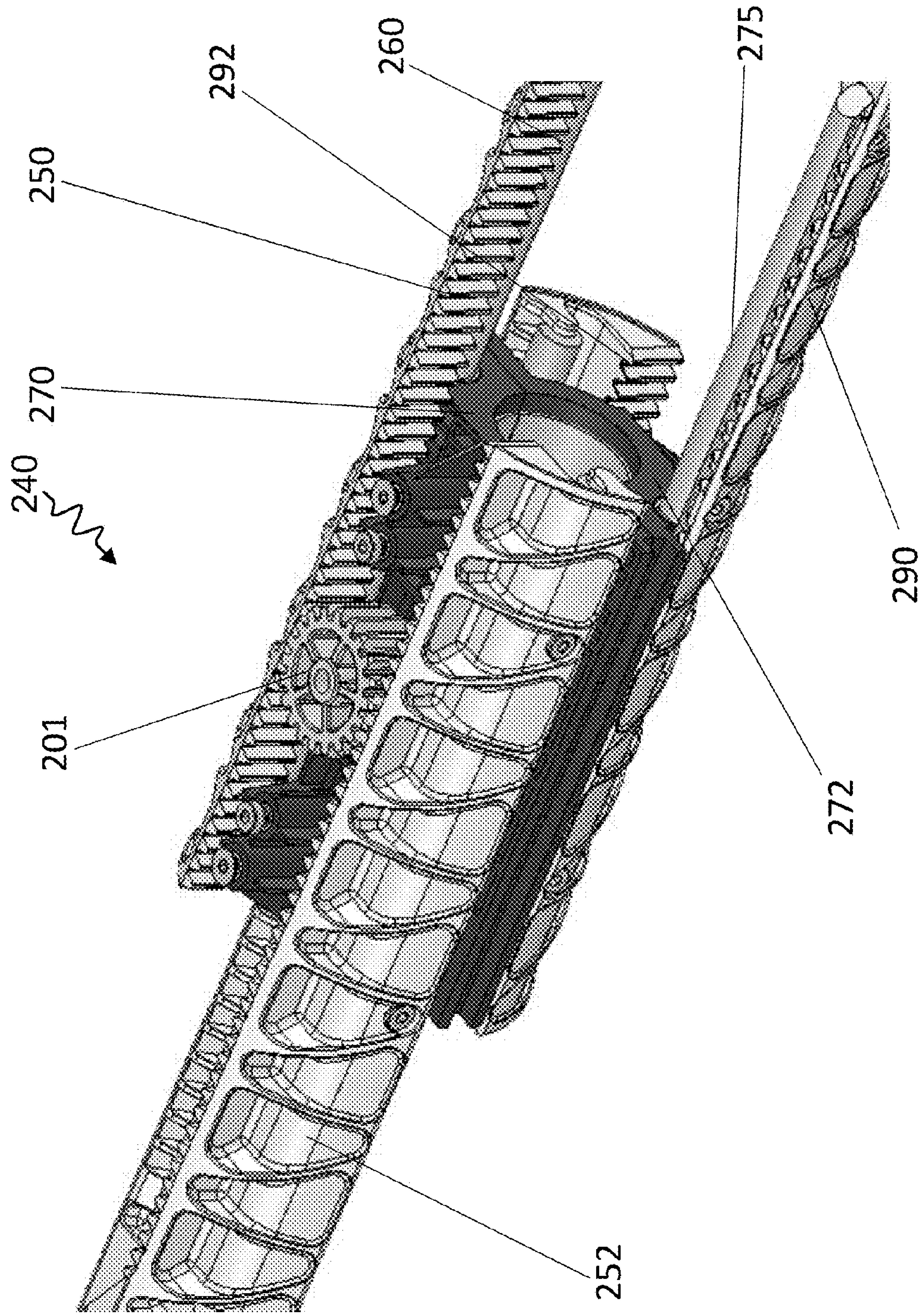


FIG. 19

COMPRESSIBLE BARBELL ADAPTER

CLAIM OF PRIORITY

The present application for patent claims priority to U.S. Provisional Patent Application No. 61/672,671 entitled "Compressible Barbell Adapter" filed Jul. 17, 2012, the entire disclosure of which is hereby expressly incorporated by reference herein.

BACKGROUND

1. Field

The present invention relates to the field of exercise devices, and more specifically to adapters for bars with compressible and retractable shafts.

2. Background

Personal training has become increasingly popular in the last decade. Sophisticated training equipment is continuously devised, and new methods of isolating muscles or increasing cardiovascular fitness are always being developed and refined. In particular, many devices attempt to focus on pectoral muscles, such as chest press or chest fly machines. In these machines, a user sits on said machine and pushes outward on handles connected to weights by means of rods or cables. In other exercise machines, such as machine-assisted bench presses, a user lies down and lifts a bar of weight, guided along rails.

Many devices, and in particular barbells, have been devised in order to increase the amount of work done by the pectoral muscle during a chest press, and the total area of the muscle affected by the exercise. Specifically, U.S. Pat. No. 4,775,149 (Wilson), U.S. Pat. No. 6,022,300 (Hightower), U.S. Pat. No. 7,086,999 (Jeneve et al.), U.S. Pat. No. 7,862,486 (Watson) and U.S. Pat. No. 7,892,158 (Varga) disclose various types of rods or barbells to further provide a work out for pectoral muscles.

In particular, Watson and Hightower disclose a barbell with rotating handgrips. The rotational handgrips are utilized in order for a user to further increase muscle building, as it provides pronation and supination motion to increase load on wrists, elbows and forearms. The main issue with said devices is that they cannot provide any additional load to the inner pectoral muscles as well to the deltoids and back. Indeed, the rotating handles simply affect the pronation and supination motion which in turn affects forearms, wrists and elbows. If additional, concentrated work needs to be done to the pectoral, deltoid and back muscles, this is not possible with these devices.

Other devices such as disclosed by Varga, Wilson and Jeneve et al. can fix the aforementioned issues, as they each disclose a rod and barbell with slidable handles along its shaft. Varga's device specifically discloses a tube with slidable handles, meant to be utilized in order to increase the difficulty of pushups with respect to pectoral muscles. A user positions himself or herself for a pushup, with hands on the handles. The handles can then slide along the tube by means of linear bearing assemblies. Wilson discloses a shaft, also with slidable handles in between sets of coiled springs. A user grips onto the handles of the shaft, and slides the handles laterally along the axis of the shaft, engaging the coiled springs such that a more complete muscle workout is achieved. Although not specifically meant to be utilized as a barbell, the slidable handles add additional pressure onto the pectoral muscles. Jeneve et al. discloses a barbell with weight attachment means, meant to be utilized for bench presses, with slidable handles along its shaft. Indeed, as user lies down

with the barbell and weights onto the weight attachment means, when performing a chest press, the user can slide the handles laterally along the axis of the shaft in order to further increase resistance to pectoral muscles.

Unfortunately, while Varga, Wilson and Jeneve's devices can provide a further work out to the pectoral muscles, they each have problems that need to be overcome. Specifically, Wilson's bar cannot support weight, such that it can simply be used for stretching and light exercise purposes. Arguably, even if weight attachment means were present, the weights would cause a possible imbalance on the barbell as the user would struggle to slide the handles along the coiled springs. The coiled springs would not necessarily compress or retract in a mirrored fashion, causing the weight to tip on one side or another and render this device ineffective. Meanwhile, Varga's device is again not suited for weights. The device simply supports the upper body weight of a user, and uses a bearing system to slide the handles along the axis of the tube. Since it is not designed to support weight, the bearing system would provide the same faults as Wilson's device, as the bar would never be able to balance itself and would tilt one way or another, causing injury. Finally, Jeneve's device consists of a barbell with weight attachment means, specifically designed for a bench press workout whereby the handles slide along the axis of the barbell. Jeneve uses a cable/belt and pulley system, such that there are four pulleys within the bar itself and the handles consequently remain equidistant from one another. A first, wider tube is telescopically fitted within a second, narrower tube that encompasses the belt and pulley system. This system's pulley system is not sturdy and can cause problems when a user is using it in an exercise room. Further, while the patent discloses a damper system, it does not state how this system would work or be implemented with a pulley barbell. Jeneve's device also may be difficult to fix or replace as there are many moving parts within it.

Overall, all five enumerated patents have problems that need to be overcome in order for a device to properly incorporate slidable handles to adequately work out pectoral, deltoid and back muscles. The present device can overcome all of these issues, while using a completely different type of compression-retraction means that will be further explained below.

SUMMARY

In a first aspect, the present invention provides a compressible barbell adapter comprising: a hollow shaft for receiving a bar; a compression-retraction member connected to the shaft; and, slidable handles operatively connected to the compression-retraction member, allowing for the slidable handles to slide along the hollow shaft.

In a second aspect, the present invention provides a method of using a compressible barbell adapter comprising the steps of: sliding a hollow shaft of the compressible barbell adapter onto an existing bar; securing the compressible barbell adapter onto an existing bar by means of securing means; and moving slidable handles of the compressible barbell adapter along the hollow shaft.

According to one aspect, the upper tube is operatively connected to the exit port through an upper lock nut and a J-tube. According to another aspect, the lower tube is operatively connected to the entry port through a lower lock nut and an L-tube. According to yet another aspect, the water recycling unit and/or the mobile water recycling unit further comprises a check valve to allow water to pass through the pump.

According to one aspect, the water recycling unit and/or the mobile water recycling unit further comprises a check

valve to preserve water in the pump. According to another aspect, the filter further comprises a filter element to filter smaller debris. According to yet another aspect, the filter further comprises a filter cage to filter larger debris.

According to one aspect, the pump is non-submersible. According to another aspect, the pump is submersible.

BRIEF DESCRIPTION OF THE DRAWINGS

It will now be convenient to describe the invention with particular reference to one embodiment of the present invention. It will be appreciated that the drawings relate to one embodiment of the present invention only and are not to be taken as limiting the invention.

FIG. **1** is a perspective view of a compressible barbell adapter, according to one embodiment of the present invention.

FIG. **2** is a perspective view of a compression-retraction member as installed on a compressible barbell adapter, according to one embodiment of the present invention.

FIG. **3** is a perspective view of guiding rails and racks mounted on clamping blocks as found in the compression-retraction member, according to one embodiment of the present invention.

FIG. **4** is an exploded view of upper and lower clamping blocks as installed in a compress-retraction member, according to one embodiment of the present invention.

FIG. **5** is a perspective view of a compression-retraction member without an upper damper and upper adapter plate, according to one embodiment of the present invention.

FIG. **6** is a perspective view of a compression-retraction member fastened onto a shaft without the upper damper and upper adapter plate, according to one embodiment of the present invention.

FIG. **7** is a perspective view of a first handle as installed on a compressible barbell adapter, according to one embodiment of the present invention.

FIG. **8** is a perspective view of a transparent first handle with accompanying bushings, according to one embodiment of the present invention.

FIG. **9** is a perspective view of a compressible barbell adapter without first and second weight attachment means, according to one embodiment of the present invention.

FIG. **10** is a perspective view of a bar and a first weight attachment means unfastened to said bar, according to one embodiment of the present invention.

FIG. **11** is a perspective view of a compressible barbell adapter slid onto a bar, according to one embodiment of the present invention.

FIG. **12** is a perspective view of a bar fastened to first and second weight attachment, according to one embodiment of the present invention.

FIG. **13** is a side view of first weight attachment means fastened to the bar, according to one embodiment of the present invention.

FIG. **14** is a perspective view of an array adapter plate fastened onto the compressible barbell adapter, according to one embodiment of the present invention.

FIG. **15** is a top view of an LED array fastened onto an array adapter plate, according to one embodiment of the present invention.

FIG. **16** is a perspective view of an LED array fastened onto an array adapter plate, according to one embodiment of the present invention.

FIG. **17**A is a perspective view of an LED array, according to one embodiment of the present invention.

FIG. **17**B is another perspective view of an LED array, according to one embodiment of the present invention.

FIG. **18** is a perspective view of a compressible barbell adapter, according to a second embodiment of the present invention.

FIG. **19** is a perspective view of a compression-retraction member as installed on a compressible barbell adapter, according to a second embodiment of the present invention.

DETAILED DESCRIPTION

The present invention will now be described more fully hereinafter with reference to the accompanying drawings, in which preferred and other embodiments of the invention are shown. No embodiment described below limits any claimed invention and any claimed invention may cover processes or apparatuses that are not described below. The claimed inventions are not limited to apparatuses or processes having all the features of any one apparatus or process described below or to features common to multiple or all of the apparatuses described below. It is possible that an apparatus or process described below is not an embodiment of any claimed invention. The applicants, inventors or owners reserve all rights that they may have in any invention claimed in this document, for example the right to claim such an invention in a continuing application and do not intend to abandon, disclaim or dedicate to the public any such invention by its disclosure in this document.

With reference to FIG. **1**, a compressible barbell adapter **10** is shown. The compressible barbell adapter **10** is primarily comprised of first and second slidable handles **25**, **30**, a hollow shaft **35** and a compression-retraction member **40**. The compressible barbell adapter **10** can be slid onto an existing bar (not shown) comprised of first and second weight attachment means **15**, **20**. The installation of the compressible barbell adapter **10** onto a bar is further described below. Weights can be fitted onto first and second weight attachment means **15**, **20** in order to increase or decrease the weight of the barbell **10**, and consequently increase or decrease the difficulty of the exercise. A worker skilled in the relevant art would appreciate that various types of weights can be fitted onto the first and second weight attachment means **15**, **20**. First and second slidable handles **25**, **30** can be gripped, and allow for lifting the barbell **10** in an upward or downward motion. Said motion is meant to primarily exercise the pectoral, deltoid and back muscles and is commonly referred to as a bench press exercise. First and second slidable handles **25**, **30** also slide along the axis of the shaft **35**, perpendicular to the lifting field of motion, in such a way so as to create an additional load on the inner pectoral muscles, and deltoid and back muscles.

With reference to FIG. **2**, the compression-retraction member **40** is shown in greater detail. The compression-retraction member **40** consists of an upper damper **45** operatively connected to first and second upper racks **50**, **52**, as well as first and second upper guiding rails **60**, **62**. These parts are mirrored on the underside of the barbell, such that, on the underside of the barbell, there is a similar lower damper, first and second lower racks, and first and second lower guiding rails, all of which are not shown. First and second upper tracks **50**, **52**, as well as first and second upper guiding rails **60**, **62** are fastened to first and second handle flanges, **55**, **57** by means of screws, in order to restrict the movement of the first and second slidable handles **25**, **30** along the axis of the shaft **35**. The upper damper **45** is fastened by means of screws to an upper adapter plate **65**, and serves to increase or decrease the force applied to an upper pinion (not shown) such that the rotational movement of the upper pinion (not shown) is made more or less difficult. In turn, the compression or retraction motion of the barbell along the axis of the shaft **35** is restricted, depending on the force of the upper damper **45** and lower damper (not shown) as well. In this embodiment of the invention, the upper damper **45** and lower damper (not shown) are non-adjustable (i.e. fixed) resistances. A worker skilled in the relevant art would appreciate that a number of dampening systems connected to the compression-retraction member could be used, such as upper and lower dampers that have adjustable resistances, or single direction resistances that only apply during a compression or that only apply during a retraction (extension). Alternatively, a worker skilled in the relevant art could appreciate that no dampening system could be used, such that there is a little to no friction and as such the movement in the compression or retraction of the shaft is unforced. The dampers utilized in the present system are well known in the art and are interchangeable with other dampers as known in the art. The lower damper (not shown) is connected to a lower adapter plate **67**, and serves the same purpose as the upper damper **45**. Both upper and lower adapter plates, **65**, **67** are separated from one another via first and second rail supports, **66**, **68** as well as first and second clamping blocks **70**, **72**. Said first and second rail supports **66**, **68** are also mirrored on the opposite side of the compression-retraction member, such that there are third and fourth rail supports. Together, first and second rail supports **66**, **68** as well as third and fourth rail supports (not shown) serve to encase and guide the first and second upper racks **50**, **52** as well as the first lower rack **90** and the second lower rack (not shown). The first rail support **66** and the third rail support (not shown) are both connected to the upper adapter plate **65** and the first clamping block **70**, while the second rail support **68** and the fourth rail support (not shown) are both connected to the lower adapter plate **67** and the second clamping block **72**. First and second clamping blocks **70**, **72** are W-shaped and contain grooves (not shown) which serve to house the first and second upper guiding rails **60**, **62** as well as first and second lower guiding rails (not shown). The interaction of the first and second clamping blocks **70**, **72** is further detailed below.

With reference to FIG. **3**, the first and second clamping blocks **70**, **72** are shown without the upper damper, the upper adapter plate, second upper rack and the lower adapter plate. The first and second clamping blocks **70**, **72** remain connected to the shaft **35**, to the first and second upper guiding rails **60**, **62** and to the first lower guiding rail **75**. First and second upper connecting members **80**, **82** are also shown, which serve to create a connection between the first and second upper guiding rails **60**, **62** and first upper rack **50** and second upper rack (not shown). The first lower connecting member **85** is also shown, creating a connection between the first lower rack **90** and first lower guiding rail **75**. When fitted one on top of the other, first and second clamping blocks **70**, **72** create a central aperture that serves to house the shaft **35**. The first clamping block **70** has two upper grooves to guide the first and second upper guiding rails **60**, **62**, while the second clamping block **72** has two lower grooves to guide the first lower guiding rail **75** and the second lower guiding rail (not shown) which is parallel to the first lower guiding rail **75**.

With reference to FIG. **4**, the first and second clamping blocks **70**, **72** are shown separated one from the other and in greater detail. A central aperture **95** is also shown in greater detail and serves to house the shaft (not shown) of the barbell. First and second upper grooves **100**, **102** and first and second lower grooves **105**, **107** serve to guide first and second upper guiding rails (not shown) and first and second lower guiding rails (not shown), respectively. Also shown are first, second, third and fourth rail bushings **96**, **97**, **98**, **99**, whereby the first rail bushing **96** fits into the first upper groove **100**, the second rail bushing **97** fits into the second upper groove **102**, the third rail bushing **98** fits into the first lower groove **105** and the fourth rail bushing **99** fits into the second lower groove **107**. All rail bushings **96**, **97**, **98**, **99** have indentations **108** that lock into notches **109** within the first and second upper and lower grooves **100**, **102**, **105**, **107**. A worker skilled in the relevant art would appreciate that first and second clamping blocks can be made of any material, and will generally have a tape or friction enhancing medium in the center to ensure clamping to the shaft, which in this case are described as rail bushings **96**, **97**, **98**, **99**. A worker skilled in the relevant art would also appreciate an alternate embodiment, whereby the clamping blocks could be designed to have a slightly larger central aperture than the shaft, therefore allowing the shaft to move freely within said central aperture. This would require the addition of two collars fastened around the shaft, located on each side of the clamping blocks to prevent the shaft from sliding on either side of the compression-retraction member. This alternate embodiment would allow for a user to rotate the compressible barbell adapter independently of the weights located on the weight attachment means

With reference to FIGS. **5** and **6**, the compression-retraction member **40** is shown without the upper damper and the upper adapter plate. An upper pinion **110** is shown, connected to both first and second upper racks **50**, **52**. By adjusting the upper damper (not shown), the ability of the upper pinion **110** to rotate is facilitated or hindered. Consequently, when force is applied from the first and second handles **25**, **30** inwards with respect to the axis of the shaft **35**, the upper pinion **110** will dictate the ability and ease of the linear movement of the first and second upper racks **50**, **52**. Said linear movement of the first and second handles **25**, **30** is represented by an arrow. The movement of first and second handles **25**, **30** and consequently of the compression-retraction member **40**, is limited by first and second abutment collars **115**, **117**. Indeed, the barbell **10** has two extremities of movement. The first is when the first and second handles **25**, **30** make contact with the first and second abutment collars **115**, **117**, respectively. At this moment, the lateral movement along the axis of the barbell **10** is maximally extended, and thus the barbell **10** is in its most retracted position. The second extremity of movement is when the first and second upper racks **50**, **52** and first and second lower racks **90**, **92**, make contact with the second and first handle flanges **55**, **57**, respectively. At this moment, the lateral movement along the axis of the barbell **10** is minimally extended, and thus the barbell **10** is in its most compressed position. This movement is then further repeated until the exercise is complete. As clearly shown in FIG. **5**, one of the key features of the device is that the position of the upper pinion **110** is fixed with respect to the positions of the first and second upper racks **50**, **52**. In turn, the positions of first and second handles (not shown) are always equidistant with respect to the upper pinion **110**. This feature results in enhanced safety when operating the barbell as the first and second handles (not shown) always exert the same force perpendicular to the axis of the shaft **35**.

With reference to FIGS. **7** and **8**, the first handle **25** is shown fastened to the shaft **35** in greater detail. One extremity of the first handle **25** is shown sandwiched between the shaft **35** and the first flange aperture (not shown). The first handle flange **55** thus serves to keep the first handle **25** secured in that position and does not allow a rotational movement of the first handle **25**. Additionally, first and second bushings **120**, **122** are shown, located at both extremities of the first handle **25**, between said first handle **25** and the shaft **35**. Said first and second bushings **120**, **122** perform the function of further keeping the first handle **25** secured in that position, as well as to allow for easy gliding along the shaft. Identical bushings are located under the second handle (not shown) and serve the same purpose. A worker skilled in the relevant art would appreciate that the easy gliding and motion along the shaft can also be achieved by linear bearings, or a system integrated into the handles themselves based on clearances or other lubrication methods.

With reference to FIG. **9**, the compressible barbell adapter **10** is shown without the first and second weight attachment means. First and second abutment collars **115**, **117** are shown in greater detail, separated from the weight attachment means (not shown) by first and second spacers, **130**, **132**. Said first and second spacers **130**, **132** are hollow and are utilized in order to fit an existing bar (not shown) through the first spacer **130**, through the first abutment collar **115**, through the shaft **35**, and through the second abutment collar **117** and ultimately through the second spacer **132**. First and second abutment collars **115**, **117** are not only utilized to stop the movement of the first and second handles **25**, **30** as described above, but can also be tightened by means of screws around both the shaft **35** and the bar (not shown) to secure said bar (not shown) within its place. A worker skilled in the relevant art would appreciate that while the present embodiment describes first and second abutment collars **115**, **117** as separate from first and second corresponding spacers **130**, **132**, they could be machined as one piece such that first abutment collar **115** would be machined onto first spacer **130** to form first securing means **136**, while second abutment collar **117** would be machined onto second spacer **132** to form second securing means **137**, as described in FIG. **9**.

With reference to FIG. **10**, the first weight attachment means **15** is shown removed from a bar **135**, while second weight attachment means **20** is still shown connected to said bar **135**. In order to fasten or unfasten either of the first or second weight attachment means **15**, **20**, said first or second weight attachment means **15**, **20** needs to be slid onto the bar **135** and screwed in place by means of first screw cap **140** and second screw cap (not shown). A worker skilled in the relevant art would be familiar with first and second stoppers **145**, **147**, which form part of the first and second weight attachment means **15**, **20**, respectively and are utilized in order to prevent the weights attached to weight attachment means **15**, **20** from sliding too far inward with respect to the center of the bar **135**.

With reference to FIG. **11**, the compressible barbell adapter **10** is shown slid into place onto the bar **135**. The arrow shows the directionality of the movement of the compressible barbell adapter **10**. Once the compressible barbell adapter **10** is slid onto the bar **135**, the first weight attachment means **15** is also slid back into place, onto the bar **135** and secured in place by first securing cap (not shown). In order to set the compressible barbell adapter **10** into a specific location on the bar **135**, the use of first and second abutment collars **115**, **117** and first and second spacers **130**, **132** is required, the overall functionality of which is further explained below.

With reference to FIGS. **10** and **11**, the bar **135** is shown along with first and second spacers **130**, **132** and first and second abutment collars **115**, **117**. As was described above, the compressible barbell adapter (not shown) is slid onto the bar **135**, and once the bar **135** is within the hollow tube (not shown), first and second abutment collars **115**, **117** are tightened around the hollow tube (not shown) and the bar **135** such that the compressible barbell adapter (not shown) remains in place. The compressible barbell adapter (not shown) can then be utilized in conjunction with any existing bar or with its own bar, should that alternative be preferred.

With reference to FIG. **14**, a second embodiment of the compressible barbell adapter **10** is shown. Said compressible barbell adapter **10** comprises an array adapter plate **150** that is nearly identical to the adapter plate as was described in the first embodiment, but includes additional features such as an LED array **155**. The LED array **155** is meant to be a guide that will illuminate depending on which side the bar is being tilted (i.e. whether the bar is level or not with respect to the ground). The functioning of the LED array **155** is further explained below. In this embodiment, the array adapter plate **150** also includes the damper **45**.

With reference to FIGS. **15** and **16**, the LED array **155** is shown fastened onto the array adapter plate **150** in greater detail. The LED array **155** is fastened onto the adapter plate **150** by means of first and second array screws **157**, **159**. The LED array **155** fits into a cavity (not shown) of the adapter plate **150** such that the adapter plate **150** remains of a similar width as the adapter plate (not shown) of the first embodiment. The damper **45** is still in the same position as it was in the first embodiment.

With reference to FIGS. **17***a* and **17***b*, the LED array **155** is shown in greater detail. Also shown are LEDs **160** which light up depending on the level of the bar (not shown) with respect to the ground. A battery **165** serves to power the LED array and the controller **170**. In order for the LED array **155** to function properly, the mercury levelling instrument **175** measures the level of the bar (not shown). A worker skilled in the relevant art would be familiar with a mercury levelling instrument **175** or any alternative form of leveller that could be utilized without departing from the scope of the invention. The functioning of the levelling instrument **175** is not necessary for the purposes and scope of the present invention. Based on the position of the mercury in the mercury levelling instrument **175**, the controller **170** determines which LED **160** to light up. If the bar is level, the LED **160** at the center of the array will light up, and as the bar becomes more inclined to one side or the other, LEDs **160** will light up one way or another accordingly. In this embodiment, the LED array **155** has 7 LEDs **160**, but a worker skilled in the relevant art would appreciate that any other number of LEDs could be utilized to achieve the same effect. Indeed, a worker skilled in the relevant art would be familiar with various types of lighting that could be utilized here without departing from the spirit of the invention, including, but not limited to, a wider or larger LED array, a liquid crystal display (LCD), a plasma display, a laser display, a numeric (digital) display, etc.

With reference to FIGS. **18** and **19** and according to a second embodiment of the present invention, a compressible barbell adapter **210** is shown. The second embodiment of the compressible barbell adapter **210** is comprised of first and second slidable handles **225**, **230**, a hollow shaft **235** and a compression-retraction member **240** located within a cover **202**. As was the case in the first embodiment, the compression-retraction member **240** is further comprised of an upper pinion **201** and a lower pinion (not shown), first and second upper racks **250**, **252** and first and second lower racks **290**, **292**. The compression-retraction member **240** is also comprised of first and second clamping blocks **270**, **272** as well as first upper guiding rail **260** and second upper guiding rail (not shown) and first lower guiding rail **275** and second lower guiding rail (not shown). In said second embodiment, rail supports that were utilized in the first embodiment of the present invention are not needed as the first and second upper and lower racks **250**, **252**, **290**, **292** have a different shape which enables them to slide effortlessly against the cover **202**.

Unlike the plastic construction of the compression-retraction member (not shown) of the first embodiment, the compression-retraction member **240** in this second embodiment is now mainly comprised of aluminum components in order to strengthen the compressible barbell adapter **210**. The upper and lower dampers have been removed from this particular embodiment; however, a worker skilled in the relevant art would appreciate that said dampers could still be present if necessary, and could act in either a compression only, a retraction only, or both.

A worker skilled in the relevant art would be familiar with additional embodiments of the compression-retraction member, without departing from the spirit of the invention. Indeed, as described above, the system could be easily devised with no dampening system, such that it is only a system of racks and pinions to compress and retract (expand) the barbell. Alternatively, a dampening system could be utilized whereby the resistance of the damper is either fixed (as is the case in the present embodiment) or adjustable. In both aforementioned dampening cases, the resistance applied could be applied in only one direction, such that only the compression or only the retraction of the barbell would offer resistance. Further, a device could easily be devised that would have the dampening system integrated directly into the pinion, such that the pinion itself provides the resistance to the racks. A worker skilled in the relevant art would also appreciate that a locking mechanism could be implemented, such that the rack and pinion system as described above would be locked into place, and no compression or retraction of the barbell is possible while the device is locked. In yet another embodiment, 4 pinion gears could be utilized, spaced around the radial direction of the shaft equally at 90° increments with 4 double-sided gear racks. In this alternative embodiment, each rack would be contacting 2 adjacent gears, but in the same position as described in the present embodiment. This would result in removing the current bushings that serve as guide for the racks. In yet another embodiment, the device could also be devised without the bushings or sliding members as described herein. Indeed, such an embodiment would be possible where the support and guiding functions are replaced by a center clamp and an outer shell of appropriate and corresponding tolerance. In yet another embodiment, the pinion and rack system could be utilized in conjunction with a spring or coil member to offer the appropriate resistance. Indeed, a single motor spring or multiple extension springs with one side fixed to the center clamp and the other fixed to the inside of the rotating gears (pinions) would provide unilateral and constant resistance in both the compression and the retraction of the barbell. In another embodiment, a worker skilled in the relevant art would appreciate that the pinion and rack system utilized could be replaced with a pinion and rack system that would be a friction-based system instead of the indentations as currently disclosed. In other words, the pinions and racks would still be present, but instead of the indentations on the pinion engaging corresponding indentations on the racks, the pinions would consist of a smooth surface that would cause friction with a corresponding surface on the racks.

While the above-mentioned embodiments have described a situation where the compressible barbell adapter is utilized for chest presses and thus the strengthening of the pectoral, deltoid and back muscles, a worker skilled in the relevant art would appreciate that said compressible barbell adapter could also be utilized in the following alternate circumstances: for inclined chest presses, for shoulder exercises in front and behind one's head when seated, pull-ups or chin-ups for back strengthening in front and behind one's head, and push-ups when one grips the handles on the rake or the floor. The general benefit derived from the compressible barbell adapter stems from the fact that the handles are able to slide along the shaft and exactly opposed to a central point on the compression-retraction member.

Although the invention has been described above by reference to certain embodiments of the invention, the invention is not limited to the embodiments described above. Modifications and variations of the embodiments described above will occur to those skilled in the art in light of the above teachings. Moreover, with respect to the above description, it is to be repulsed that the optimum dimensional relationships for the component members of the present invention may include variations in size, material, shape, form, funding and manner of operation.

What is claimed is:

1. A compressible barbell adapter comprising:

a hollow shaft for receiving a bar;

a compression-retraction member connected to the hollow shaft further comprised of upper and lower racks operatively connected to corresponding upper and lower pinions; and,

slidable handles operatively connected to the compression-retraction member, allowing for the slidable handles to slide along the hollow shaft.

2. The compressible barbell adapter of claim **1** further comprising at least one securing means positioned on the bar.

3. The compression-retraction member of claim **1** further comprising a dampening system connected to the compression-retraction member.

4. The compressible barbell adapter of claim **3** wherein the dampening system has a fixed resistance.

5. The compressible barbell adapter of claim **3** wherein the dampening system has an adjustable resistance.

6. The compressible barbell adapter of claim **1** further comprising upper and lower guiding rails.

7. The compressible barbell adapter of claim **1** further comprising clamping blocks for receiving the shaft.

8. The compressible barbell adapter of claim **1** further comprising an adapter plate with an LED array.

9. The compressible barbell adapter of claim **1** further comprising a cover.

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